Proof of the Riemann´s Hypothesis using the limit of the derivative to the imaginary

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Abstract

Many mathematicians have tried over the past 150 years to prove Riemann's hypothesis by various methods, and have so far failed to prove that the real part of the complex numbers of the zeta function rests on a critical line equal to ½ for all non trivial zeros and its relation to prime numbers . Perhaps previous mathematicians lacked a notion that had not existed before that was crucial to resolution, perhaps the focus has become too complex to escape the simplicity needed to understand and resolve the dilemma. So I tried to choose to solve the question using a device that did not exist until now that is the limit of the derivative of x tending to the imaginary, which applied the function zeta, when considering it imaginary, provides a unique and necessary instrument for its solution, demonstrating through graphs and various forms of equations, one can prove the uniqueness with which prime numbers behave in relation to their imaginary and real forms.

Keywords: Riemann Hypothesis, Reimann Zeta Fucntion, trivial zeros, non trivial zeros, limit of derivative to the imaginary, millennium prize

Introduction:

Considering the expression that satisfies the $\zeta\,(s)$, zeta function ,expressed in the following term $s = \theta + i * t$, then considering $\theta = \frac{1}{2}$, it is possible to obtain a value for the relation of "i" to "t", when s tends to the limit of "i", as a manner to investigate the properties of the zeta function:

(A)

$$s=\theta+i*t$$

$i=\theta+i*t$

i-i*t= θ

i*(1-t)= θ

i*(1-t)=$\frac{1}{2}$

i=$\frac{\frac{1}{2}}{\frac{(i-t)}{1}}$ ➔ i=$\frac{1}{2*(i-t)}$

1-t=1/2i

$1=\frac{1}{2i}+t$ ➔ $1=\frac{1+2it}{2i}$ ➔ 2i=1+2it ➔1=2i-2it ➔ 1=2i*(1-t) ➔2i=$\frac{1}{1-t}$ =>

1-t=1/2i ➔ t->i means i*i=i^2 ∴ $i*t=-1$ ∴ $i=-1$ so $t=1$ ∴ 1-1=1/-2

i-t=$\frac{1}{2}$; with t➔i $\therefore 0=-\frac{1}{2}$ for 1=-1 or t=1 and i=-1 for i^2=i*I or I*t=-1 t must be equal 1 when t->i.

Another feature of the Riemann hypothisis states that for s=-1 the sum of the series converges to -1/12 , so if this holds true for the logics stablished in the previous calculus then the same applied logics must hold truth, what is shown below:

$$s=\theta+i*t$$

$-1=\frac{1}{2}+it$

$\frac{-2}{2}=\frac{1+2*it}{2}$ ➔ -3=2*i*t for i→ $t=-\frac{3}{2}=i^2$; $i^2=-1\rightarrow -3=-2$

Accepting this relation as a logic to follow then if -3=-2 it follows that -3+2=-1 or -2+1=-1 which is the same as saying that -2=-1 or -3=-2=-1

$$s=\theta+i*t$$

S=1/2+ -3*-2*-1 for i=t and i=-2 or -3

-1=$\frac{1}{2}$-6 ➔ $\frac{-2=1-12}{2}$ or -2=-1-12 when considering -2=-1 then -2 +1 =-12 for s=-1 which is the same as -1^-1 it can be considered -1^-1=-12^-1 ∴ $s(-1)=-\frac{1}{12}$.

Now for s=-2 or any product of s=-2*n where n = a natural integer, then substituting for s=-2 it follows the transformation for the s function:

$$s = \theta + i * t$$

-2=$\frac{1}{2} + i * t \rightarrow -4 = 1 + 2 * i * t$

-4=1+2*i^2 for t→ i and i^2 =-1 then -4=1-2 $\therefore -2 = 1$

Then -2=1/2+i*t can be written 1=$\frac{1}{2} + i^2$ or 1=$\frac{1}{-1}$+i^2 or-1=-1+(-1*-1)=> - 1=0 or 2=0 that for any multiple of 2 *n = 0*n.

All of the previous statements must hold true , only if only the derivative when x tends to i instead of zero, which can following be demonstrated to be equal "i" or any other product for the integers "n" when substituted accordingly:

$$\frac{df}{dt} = \lim_{h \to i} \frac{f(t+h)-f(t)}{h} \qquad \text{(B)}$$

For $\frac{2\pi r+x-2\pi r}{x}$ $\therefore$ 2*Pi*(r+x)-2*Pi*r=y

2*Pi*x=y

$\frac{\cancel{y}}{2\pi}x\ \frac{1}{y}\ \frac{-1}{2\pi}$ x =⟹ = $or\ 2\pi$

(r+x)=r r+x

+x=r+x

2x-x=0

X=0; $\frac{2\pi r+x-2\pi r}{2x-x} \rightarrow \lim_{x \to -y} \frac{2\pi r+x-2\pi r}{2-2\pi-2\pi}$ $\frac{-y}{}\ \frac{y}{}$ ➔ $\sqrt{}$ $\frac{2\pi r+x-2\pi r}{\frac{-y}{\pi}\ \frac{-y}{2\pi}} = \frac{-y}{-y*(\pi+1)}$ ➔ $\frac{\frac{2\pi}{\pi+1}}{\frac{2\pi}{\pi+1}\sqrt{}} = 1 * i * n$ (1)

X+y=0

X=-y

-y-y*i if i^2=-1 then $\sqrt{-1} = -1^{1/2} \rightarrow -1^1 * -1^{-2} \rightarrow \frac{-1^1}{(-1)^2} = \frac{-1}{1} = -1$

I=$\sqrt{-1}$

$x \Rightarrow y$ *(-y*$(\pi + 1)) = -\frac{}{2\pi}$ $\frac{}{2\pi}\, y^2*(\pi+1) = -y^2\pi - y^2 \rightarrow -y^2 * (\pi + 1) = 2\pi \rightarrow -y =$

$-y*(\pi+1)$ 2π 2π 2π

$\sqrt{\frac{2\pi}{\pi+1}} \Rightarrow yi = \sqrt{\frac{2\pi}{\pi+1}}$ (2)$\sqrt{}$

$= 1*$ $*$ $\frac{\sqrt{\frac{2\pi}{\pi+1}}*\sqrt{-1}}{2}$

(1) $\underline{yi}$ i $n \rightarrow$ (2) in (1) = $= \frac{\sqrt{\frac{-2\pi}{\pi+1}}}{*} = \sqrt{\frac{-2*\pi}{\pi+1}} \Big/ \frac{\sqrt{\frac{-2\pi}{\pi+1}}}{\frac{\sqrt{2\pi}}{\sqrt{\pi+1}}} * n$ ➔

$yi\ (\sqrt{-1})\ *y*_n$ $y\, n$

$$\lim_{x \to i} \frac{\sqrt{\frac{-2\pi}{\pi+1}}}{\sqrt{2\pi^2 + 2\pi}} = \frac{(\pi+1) * \sqrt{\frac{-2\pi}{\pi+1}}}{\sqrt{2\pi^2 + 2\pi * n}} \blacksquare$$

With the intent to prove that the imaginary value for the zeta fucntion rests on the ½ point of the graph , it should also be true for the derivative of the numbers in the zeta function to behave as if it has both real and imaginary parts that after ploted will exihibit a certain pattern, allowing to prove that it has derivatives everywhere and just as also to determine the eigen values for the vectors that goes to zero. In this sense if follows the programming for the proof that the imaginary numbers obtained by this derivative of x tending to the imaginary gives results that can explain ohter expected behaviors for the zeta function:

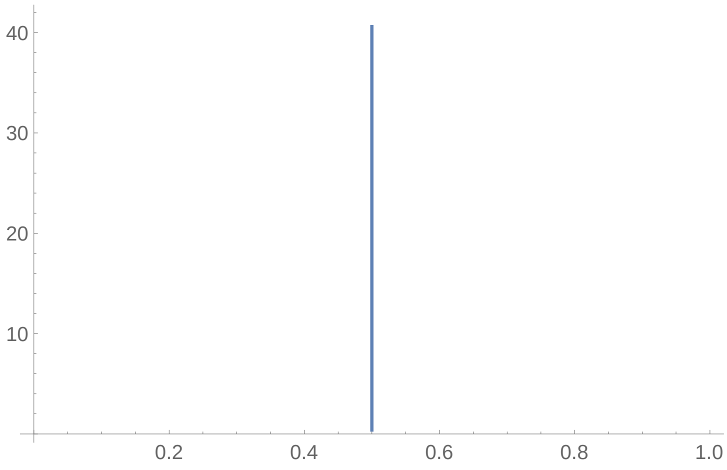
Let ff $=$ $\left(\left(\left((\mathrm{Pi}+1)*r\right)*\mathrm{Sqrt}\left[(-2*\mathrm{Pi}*r)/\left((\mathrm{Pi}+1)*r\right)\right]\right)/\left((\mathrm{Sqrt}[(2*\mathrm{Pi}*r)^2+2*\mathrm{Pi}*r/n]\right)\right)*$ $1/2$ be equal the program line for the derivative

$$\lim_{x \to i} \frac{\sqrt{\frac{-2\pi}{\pi+1}}}{\sqrt{2\pi^2 + 2\pi}} = \frac{(\pi+1) * \sqrt{\frac{-2\pi}{\pi+1}}}{\sqrt{2\pi^2 + 2\pi * n}} \blacksquare$$

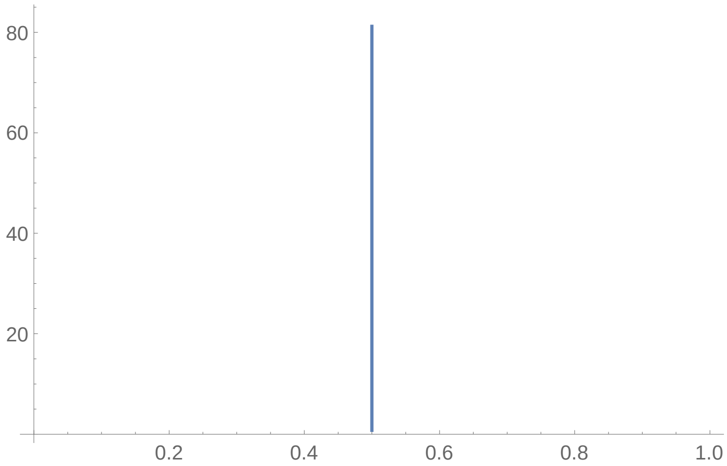
For n = Prime and r = integer, then it follows that :

ssss1 $= (1/2) + \mathrm{ff} * r$ as in s=$\theta + i * t$ when i is substituted for the derivative to the imaginary and t the real part is considered an integer of r, then the graph of the real (X axis) vs imaginary (Y axis)part equals:

(C)



Alternetively:



For ff==

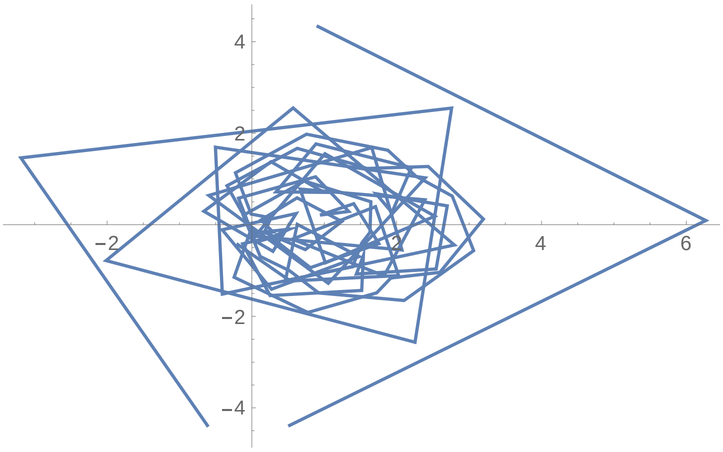
$$\left(\left(\left((\mathrm{Pi}+1)*r\right)*\mathrm{Sqrt}\left[(-2*\mathrm{Pi}*r)/\left((\mathrm{Pi}+1)*r\right)\right]\right)/\left((\mathrm{Sqrt}[(2*\mathrm{Pi}*r)^2+2*\mathrm{Pi}*r/n]\right)\right)$$

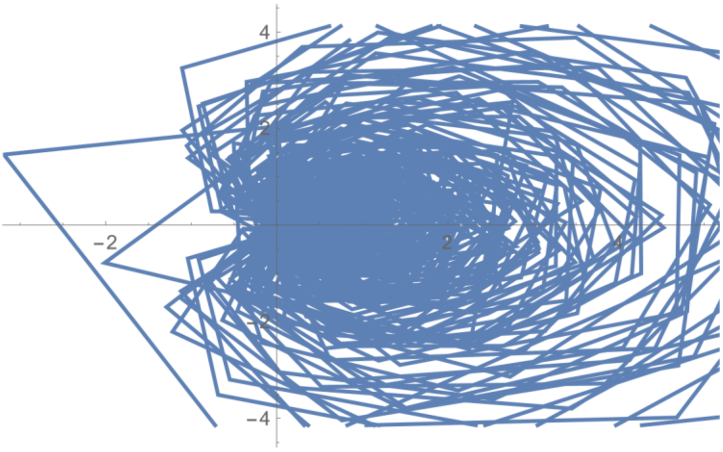
)

Where the imaginary value lies over 1/2

When further considering the sum

$\mathrm{yy2} = \sum_{\mathrm{zx}=1}^{100} 1/\mathrm{zx}^\wedge\mathrm{ssss1}\quad \mathrm{ssss1} = (1/2) + \mathrm{ff}*r$ for zx = a prime number then it is obtained the following graph:

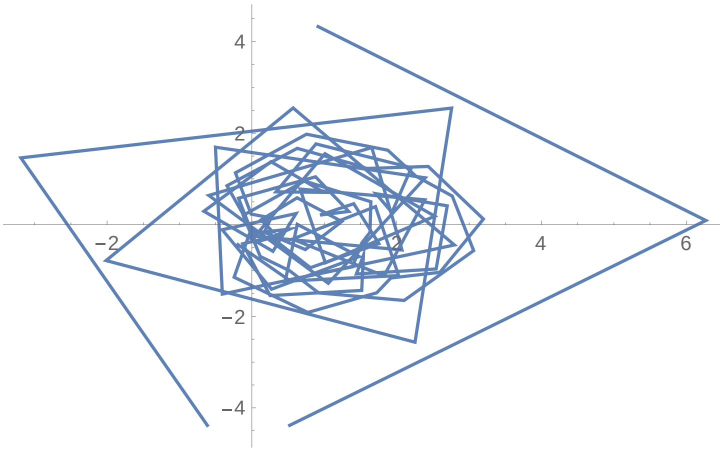


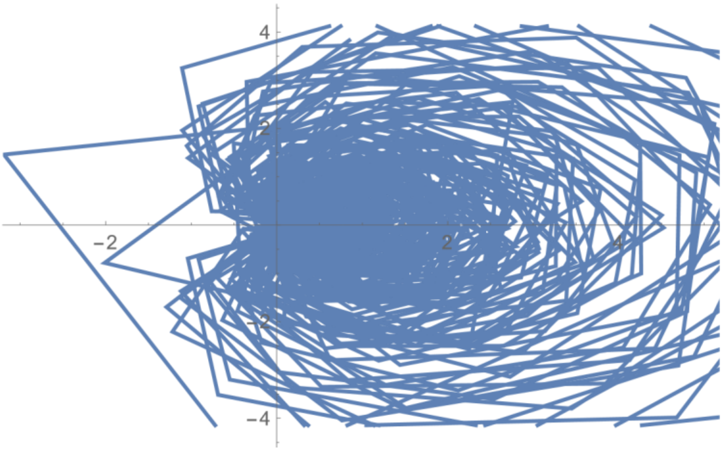


Where the angles in between the derivative values are preserved and the eigen vectors from the vertices to the zero express equal angles, and when considering the expression for the derivative of x tending to the imaginary as:

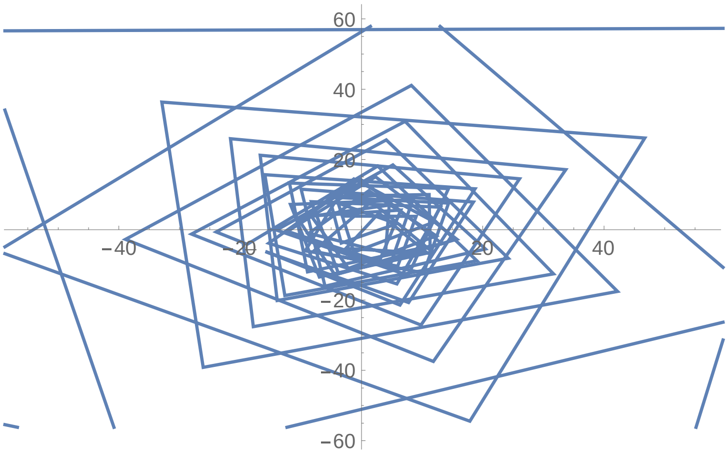
$$f = (((\mathrm{Pi}+1)*r)*\mathrm{Sqrt}[(-2*\mathrm{Pi}*r)/((\mathrm{Pi}+1)*r)])/((\mathrm{Sqrt}[(2*\mathrm{Pi}*r)^\wedge 2+2*\mathrm{Pi}*r/n]))$$

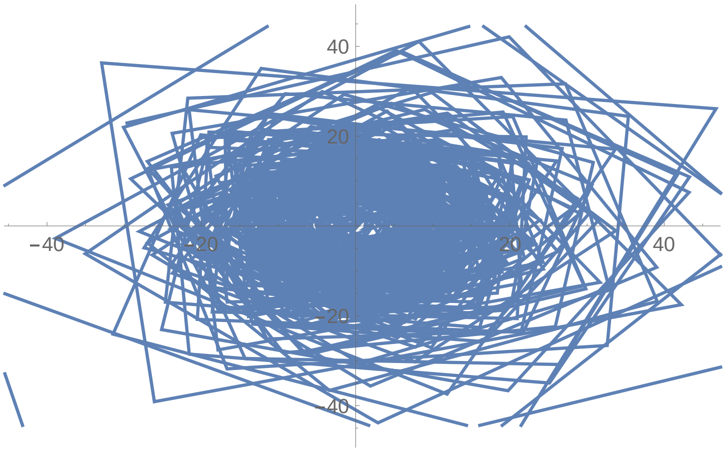
For
$\mathrm{bb} = \mathrm{Im}[f]$ and substituting for the value of $\mathrm{s1c} = ((1/2) + \mathrm{bb} * r * \mathrm{Sqrt}[-1])$ in
$\mathrm{x1c1} = \sum^{100}_{\mathrm{zx}=1} 1/\mathrm{zx}^\wedge\mathrm{s1c}$ for zx equals prime the same graph is obtained which shows that there is an Independence of ½ multiplied before:





$x1c1 = \sum^{100}_{zx=1} 1/zx\,\hat{}\,s1c$ for 1000 numbers

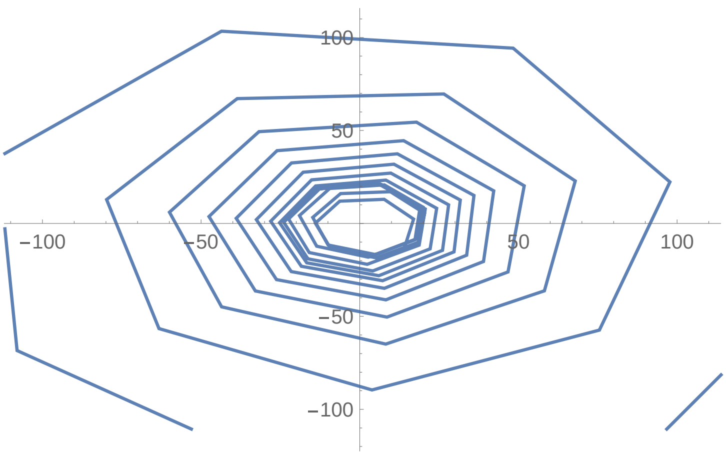




The graph above ilustrtes the sum $x2b = \sum^{100}_{zx=1} 1/zx^{\wedge}s1b$ when $s1b = ((1/2) + fsolution * bb4)$ *and* $bb4 = ReIm[fsolution]$ being fsolution the folowing equation:

$$fsolution = ((((Pi + 1) * r) * Sqrt[(-2 * Pi * r)/((Pi + 1) * r)])/((Sqrt[(2 * Pi * r)^{\wedge}2 + 2 * Pi * r/n]))) * -1/12$$,

Eventhough the value of -1/12 is considered when s=-1 it was investigated due to the fact that -1 is a possible result for the division of prime number to itself, and so it serves as a way of showing that when considered as a product to the prime numbers it reveals a pattern distribution of the lines of the vertexs to the point -1/12 and ½ to be of equal angles what satisfy one of the premisses for the zeta function as it shows that it have derivatives everywhere maintaining the proportion of the angles to each of the considered point.

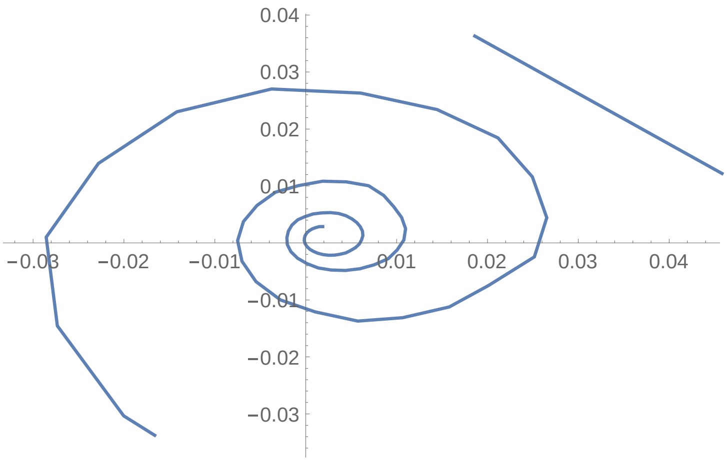


$$x1 = \sum_{zz=1}^{100} 1/zz^{\wedge}sssb$$

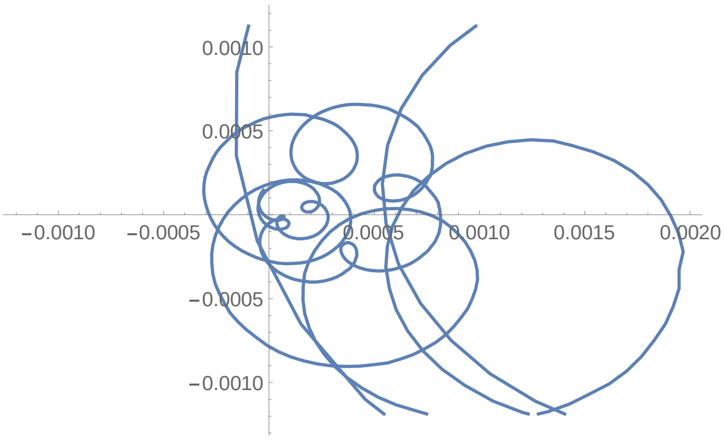
$$\mathrm{sssb} = ((1/2) + \mathrm{ffffsolution} * r)/-2$$

$$\mathrm{ffffsolution} = ((((\mathrm{Pi}+1)*r)*\mathrm{Sqrt}[(-2*\mathrm{Pi}*r)/((\mathrm{Pi}+1)*r)])/((\mathrm{Sqrt}[(2*\mathrm{Pi}*r)\hat{}2+2*\mathrm{Pi}*r/-2*\mathrm{n3}])))/-2$$

For +2 it just inverts the rotation.



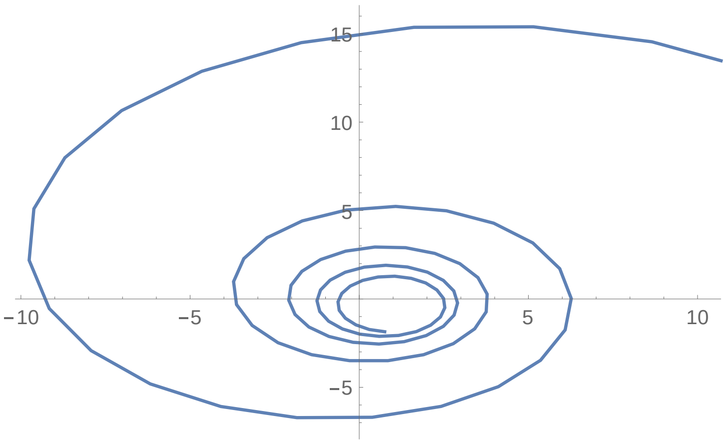
The Graph above is the same as the graph below for values of 100 and the graph below the same for values of 1000 and it remains the same for the expression of the Sin of the sum, what does not happen with the other graphics.



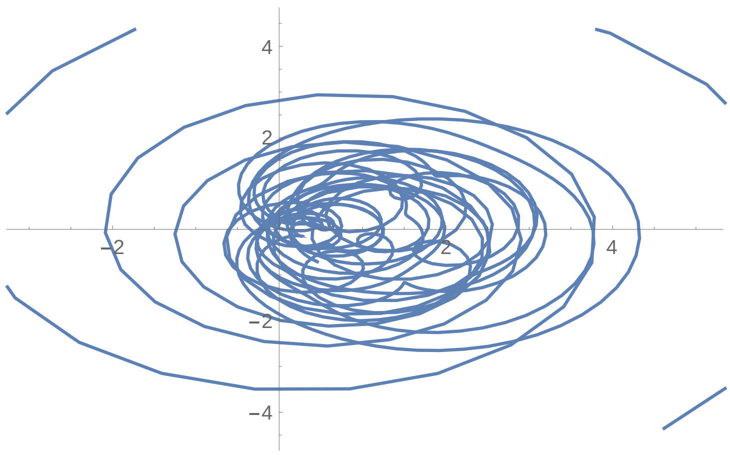
$\mathrm{cc2b} = \mathrm{Im}[\mathrm{ffffab}]$ $\quad \mathrm{sssab} = (1/2) + \mathrm{cc2b} * \mathrm{Sqrt}[-1 * -\mathrm{n3}]$ where n3= negative even number.

$$\mathrm{x1ab} = \sum_{\mathrm{zx}=1}^{100} 1/\mathrm{zx}\hat{}\mathrm{sssab}$$

$$\mathrm{ffffab} = (((\mathrm{Pi}+1)*r)*\mathrm{Sqrt}[(-2*\mathrm{Pi}*r)/((\mathrm{Pi}+1)*r)])/((\mathrm{Sqrt}[(2*\mathrm{Pi}*r)\hat{}2+2*\mathrm{Pi}*r/-0.083]))$$



100 numbers considered in the sum



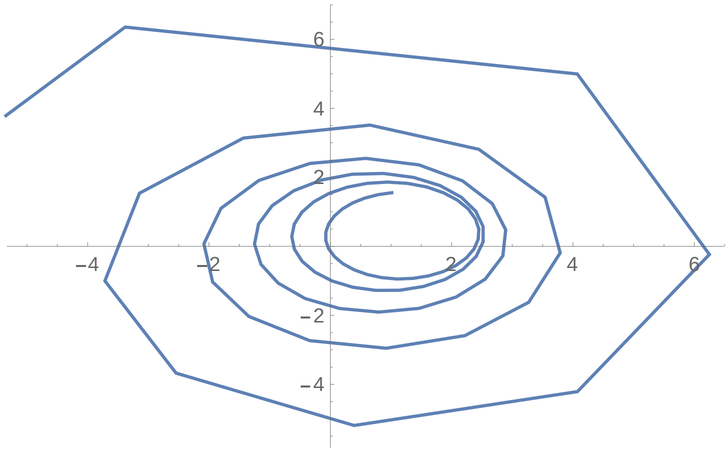
1000 numbers considered in the sum

$$x2=\sum_{zx=1}^{100} 1/zx\text{^}s1$$

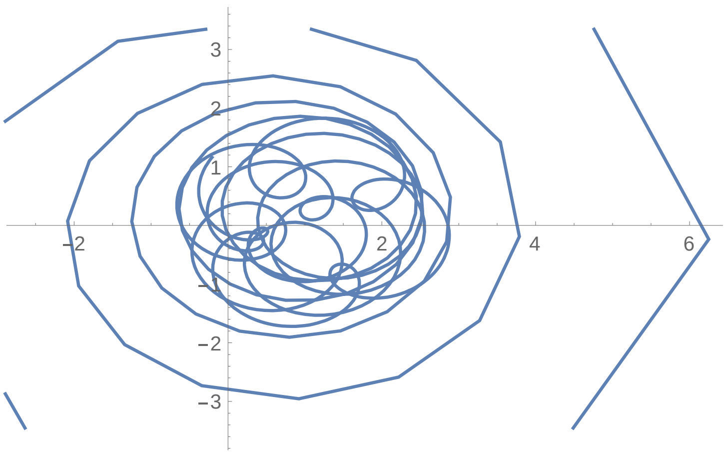
xx=ReIm[x2]

$s1 = (1/2) + \text{fsolution} * r$

$\text{fsolution} = ((((\text{Pi} + 1) * r) * \text{Sqrt}[(-2 * \text{Pi} * r)/((\text{Pi} + 1) * r)])/((\text{Sqrt}[(2 * \text{Pi} * r)\text{^}2 + 2 * \text{Pi} * r/n]))) * -1/12$



For 100 number above and 1000 below

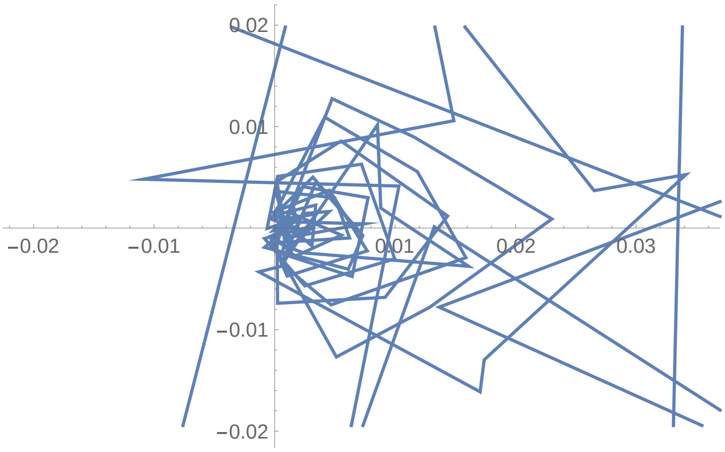


x1a=$\sum^{100}{}_{zx=1}\, 1/zx\verb|^|sssa$

xa=ReIm[x1a]

$\mathrm{sssa} = (1/2) + \mathrm{cc2} * \mathrm{Sqrt}[-1 * -\mathrm{n3}]$ where n3= negative even number
$\mathrm{cc2} = \mathrm{Im}[\mathrm{ffffa}]$

ffffa
$= (((\mathrm{Pi} + 1) * r) * \mathrm{Sqrt}[(-2 * \mathrm{Pi} * r)/((\mathrm{Pi} + 1) * r)])/((\mathrm{Sqrt}[(2 * \mathrm{Pi} * r)\verb|^|2 + 2 * \mathrm{Pi} * r/\mathrm{n3}]))$



$$\mathrm{bb} = \mathrm{Im}[f] \quad \mathrm{s1c} = ((1/2) + \mathrm{bb} * r * \mathrm{Sqrt}[-1])$$

$\mathrm{x1c1} = (\sum_{\mathrm{zx}=1}^{100} 1/\mathrm{zx}^{\mathrm{s1c}})/n$

Sin (x1c1 $= (\sum_{\mathrm{zx}=1}^{100} 1/\mathrm{zx}^{\mathrm{s1c}})/n)$

f
$=$
$(((\mathrm{Pi} + 1) * r) * \mathrm{Sqrt}[(-2 * \mathrm{Pi} * r)/((\mathrm{Pi} + 1) * r)])/((\mathrm{Sqrt}[(2 * \mathrm{Pi} * r)^\wedge 2 + 2 * \mathrm{Pi} * r/n]))$

Let x1c1 be equal x so that $x\lim_{\to 0} Sin(x)/x \; = \; \dfrac{Sin\ (x1c1 = (\sum_{zx=1}^{100} 1/zx^{s1c})/n)}{\mathrm{x1c1} = (\sum 100\mathrm{zx}=11/\mathrm{zxs1c})/n} = 1$

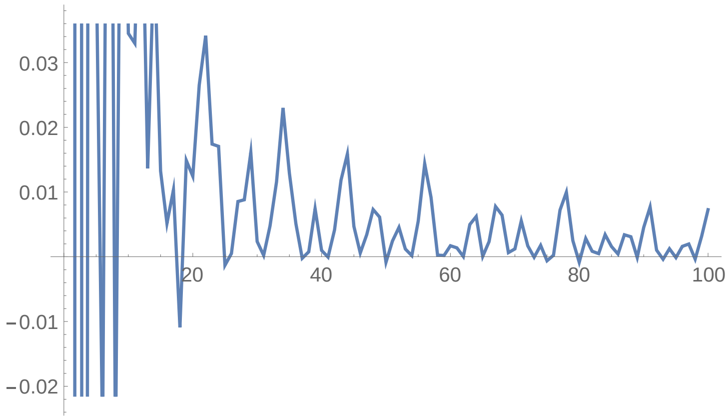
Then considering the findings in (A) as the sum x1c1 $= (\sum_{\mathrm{zx}=1}^{100} 1/\mathrm{zx}^{\mathrm{s1c}})/n$ tends to 0 ,0=1/2 for the real part, as the imaginary part equals other values that when plotted in a real and imaginary x and y axis ,it gives imaginary numbers plotted in the so called critical strip of value of ½ for the real part as shown in (C).

If the values of zx representing the prime numbers are changed to the negative even numbers , all the graphs remain the same, showing that the number o f the denominator is not decisive for the behavior of the function, but rather relies on the i*t (the imaginary portion of the s=$\theta + i * t$) that when t tends to imaginary , the real value of "t" tends also to zero, giving the result only a value of ½ for the θ when it is considered to be ½.

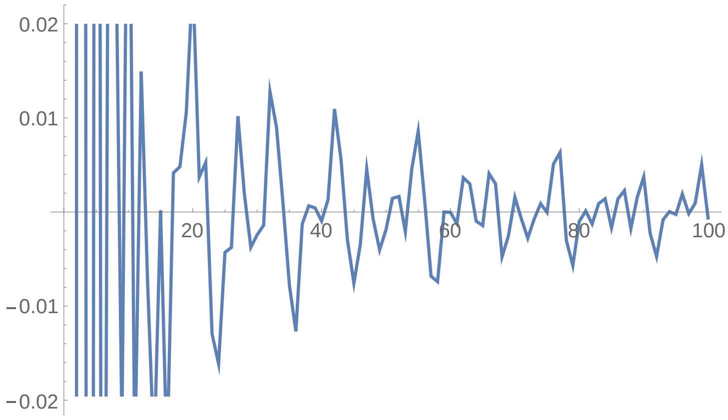
If the sum of terms is divided by n= primes, the result of the sin for the graph is absolutely equal, what does not happen when another value , as when the even negative integers are considered, so the theorem of the limit of x tending to zero for sinx/x equals 1 , is only valid in the situation that the derivative of "x" here considered to be real part of the zeta function uses of prime numbers. The theorem helps to prove that if the limit of the function when t tends to zero is equal to the fact that "t" tends to imaginary as proven by (B) in the first part of this paper, leaves only as a real part the value for θ = ½, making a transformation of the function to a real (1/2) and imaginary part (i*t->i*i) where all the imaginary numbers will be in the critical line ½ when the real part tends to zero as it is the case for the prime numbers when applied the theorem of Lim of x ->0 of sin x/x = 1, here considering to be x the value . As the sum$(\sum_{\mathrm{zx}=1}^{100} 1$

$/zx^{s1c})/n$ assumes the value of x going to zero the only variable correlated is the t of the s=$\theta + i * t$ that is derived to an imaginary value as x tends to i as shown before, simoutaneously tends to z real value of zero, making it to be considered a non trivial zero that will be plotted in the real part ½ over a critical line.

The graph for the real values of the above sum:

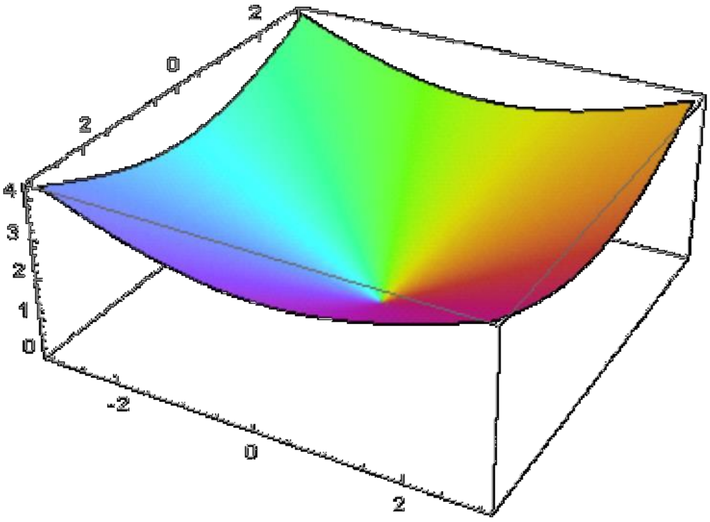


And the graph for the imaginary values:



As expected for the graph of the isolated values , reals and imaginaries, the abscissa shows the numbers in growing order in a manner that it gets closer to zero as the numbers increase as expected to be by the division of 0.5 by the prime numbers expressed by the n term of the denominator, and the ordered axis showing the limits of the division being equally distributed along the ½ critical stripe as the number being imaginary only represent ups and downs over the ordered parallell ½ critical line.

Where n =zx. The fact that the angles do not seem to be analytical continuing is because is expressed in terms of real and imaginary part as in a complex number where it representes the intersection of the real and imaginary values, so it is analytical that if the sin of the function x1c1 is obtained or by other means just analysing the complex 3D graph :

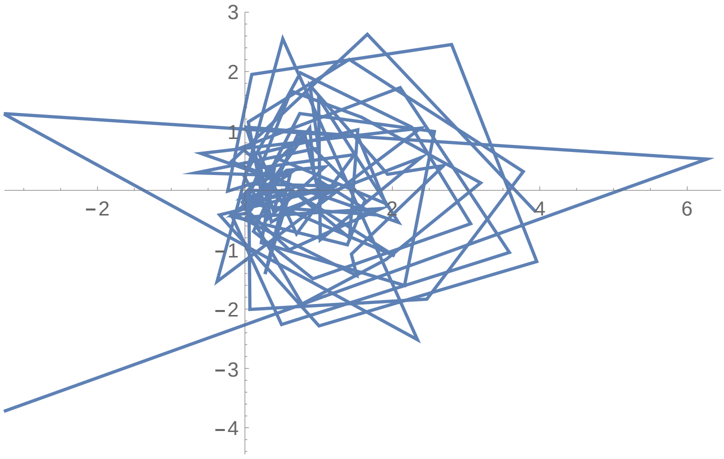


where it shows a really smooth and angle preserving characteristics for the the same case as the summation

$$= \frac{\sum_{zx=1}^{100} 1 /zxs1c\, x1c1}{n}$$

,previously shown as a very chaotic graph,plus, it does not alter the graphics as it is not the case for every other possible configuration obtained here, but only for the prime summation .Meaning to say that the sin of the function x1c1 is equal to the sum, what makes it conclusive that the result of the division being equal 1 so the sin must represent an angle in the total sum to be equal a 90 or 270 what is reasonable to think and enough to prove that the imaginary numbers of the non trivial zeros must rest in a perpendicular line to the real axis (x) ,where the imaginary value represents over just imaginary values the rising and descend of the values for the sumation of Riemann´s function for the prime numbers risen to the imaginary value of the derivative of x tending to zero, that gives properties of angle preservation when considered the sin of the function divided by a correspondent prime number, to be equal the sumation of the same function only divided by a prime number.

The graph is conformity to the fact that 0.5 / prime with two digits equals values below 0.005, showing that the ½ point of the real numbers stands for all prime numbers. Plus it exhibits the same behavior if it is represented in terms of the graph of the Sin.



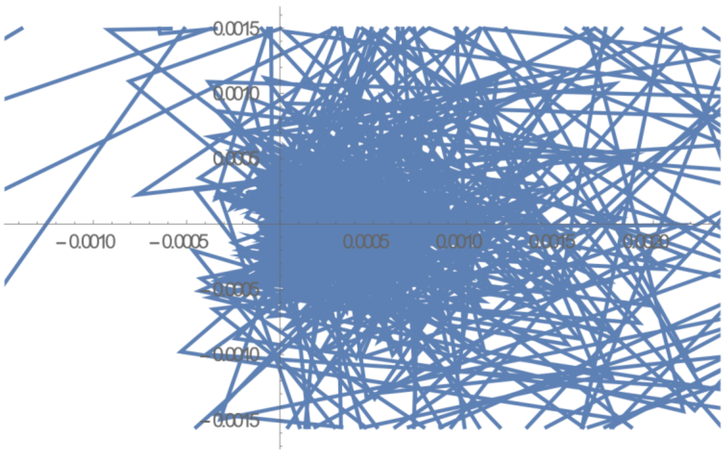
$$bb = \mathrm{Im}[f]$$
$$s1c = ((1/2) + bb * r * \mathrm{Sqrt}[-1])$$

$$x1c1 = \left(\sum_{zx=1}^{100} 1/zx^{s1c}\right)$$

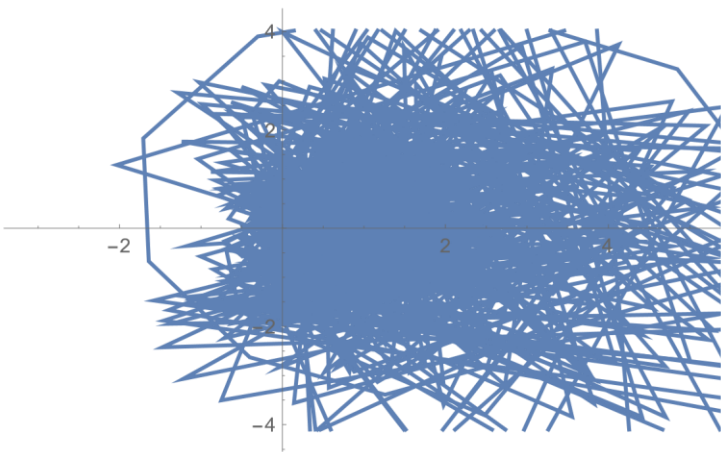
$$f = (((\mathrm{Pi} + 1) * r) * \mathrm{Sqrt}[(-2 * \mathrm{Pi} * r)/((\mathrm{Pi} + 1) * r)])/((\mathrm{Sqrt}[(2 * \mathrm{Pi} * r)\text{^}2 + 2 * \mathrm{Pi} * r/n]))$$

Stating that -3-=-2 is a false mathematical statement that comes about to become true when considering the imaginary number relation it has with the zeta function ,but it is as false as stating that 1 + 2 + 3 +4 = -1 / 12 but is considered correct in analytical continuity for convergent series, in which case I may very well bind to every value a different value by conditioning the calculations to consider now one value or another, as when there is a simultaneous overlap of values used in quantum computing, where 1 = -1 at the same time, is just an extension of the same reasoning to an ambiguous and simultaneous reality that would not necessarily be a proportion but just one rule to follow for later calculations when the computer understands and shifts the value from -3 to -2 or from -2 to --3, in an iteration form that gives rise to a new universe set with its own laws, substituting values instead to consider merely a mistake.

Miscelaneous: Graphs for the given sums for number up to 1000. Due to computer limitations it is not considered the infinit series but which does not impair the given results to be expanded for greater amounts of numbers, that can be computed for proof in super computers else where.



$$x1c1 = \left(\sum_{zx=1}^{1000} 1/zx^{s1c}\right)/n$$



$$x1c1 = \left(\sum_{zx=1}^{1000} 1/zx^{s1c}\right)$$

Continuation of the proof of the Riemann hypothesis:

Considering a general term formula for the case when the sin of the referred function is divided by n it is possible to proove that the only numbers that alow for the exponente of the s zeta function to have the number ½ to function as an exponent thus referring to the plotting of the non trivials zeros in the critical line ½ , is when it can be substituted due to a hidden porportion between the cases where we have term $s = \theta + i * t$ for term $\theta = either\ 0\ or\ 1 = s = \frac{1}{2}$ +it what can be exposed below:

$$\frac{1}{\frac{1}{n2} + n*i} = n^{-\frac{1}{2}} * n^{-ni} * (n)$$

$$n * n^{-\frac{1}{2}} * n * n^{-ni}$$

$$n \quad ni^{1/2} * n^{1-ni} = n^{\frac{1}{2}+1-}$$

$$\frac{1}{2} + 1 - ni = \frac{3}{2} - 2ni = \frac{\sqrt{n^3}}{n^{2ni}} = \frac{n\sqrt{n}}{n^{2*ni}} = \frac{\sqrt{n}}{n^{ni}} => n^{1/2} * n^{-ni} = n^{\frac{1}{2}-ni}$$

$$\frac{1}{2}- \quad = n^{\frac{1}{2}+ni} => \frac{n^{\frac{1}{2}} * n^{-}}{} = 1 * 1 \quad ni$$

$$n^{ni} \; n1/2*n+ni \qquad -1=1$$

Analogously Sin (x) * x^{-1} = 1

$$Sin\ x = x$$

$$x^1 * x^{-1} = 1$$

$$\sqrt{1} = \sqrt{x^0}$$

$$1^{1/2} = x^{0/2} \rightarrow exponents\ 0 = \frac{1}{2}$$

In this relation, if I consider a number "p" prime equal to "n", extracting the square root of the square of the same number, a relation of that number is obtained in relation to a denominator that can only be presented in a single way to if we consider that a prime number squared will only have as its square root factored a single form of presentation n / 1 and in the case of referring to a non prime number we obtain a multiplicity of factors in relation to n, from which analyzing it if the exponents always obtain a relation that does not consider as a possibility of equality a number that is equal to 1/2, in contrast to the previous relation shown to be equal or similar by comparison to sine of x equal to x that can be compared to the situation of the relation of two expressions of (s) = n1 / 2-ni = n1 / 2 + ni equal to 1.

$$p = \sqrt{n^2} = \frac{n}{1}$$

And for non-primes: np = √ (n ^ 2) = n / 2^4 * 1 / 3 for a hypothetical non-prime number like 48.

Analyzing this assumption in terms of its exponents we have:
(n / 2^4) / 3 = n / 1 → n^2 =48 n → n = $\sqrt{48} = 2^2 * 3^{1/2}$ if I consider this number to be compared to the expected result of dividing a number over itself that only get a single number resulting from this division as being 1, then, we have that the relationship of n to will be:

n ^2*$3^{1/2}$ = $2^2 * 3^{1/2}$ making the exponent as applied through the same logic before equal
n^2 = 2^2 where the exponente 2 =2 for n=2 thus not respecting the necessity for the exponent in (s) to be equal to ½ which is the same thing as considering any ohters non prime numbers not to be located as a zero for the real part of the zeta function at the point 1/2.

Otherwise, when we consider the limitation of representation of the square root of a prime number squared, we obtain the following relationship:

$\frac{-}{1} = n$ → n=n $\quad 0 = \frac{1}{2}$ $\quad n^{1/2} \rightarrow$ $for\ n = 1$. Or 1=1/2 for any n

$$s = \frac{1}{2} + i * t = \frac{s1+s2}{2} when\ s1 = 0 + i * t\ and\ s2 = 1 + i * t$$

Which are necessary conditions for s to have θ =1/2 so the exponents that have values equal zero and 1 for a ½ exponent, satisfies the premiss for the s function to exist as the ½ critical line, as observed when the summation of the two other possible simultaneous values for θ are considered that keep resemblance to the s=1/2+i*t graph of the summation of 1/n^s.

Another fact that corroborates the proof that the numbers of the critical line are infinite is the fact that the tangent of the sum of the numbers in the Riemann sequence is equal to the sine of the sum of the same numbers meaning that the hypotenusa is equal to the adjacent side or that sine is equal to tangent at point ½ making any number from which the sine is extracted that by defining the sine limit of x to zero equal to x then x = sine = tangent at point ½ and that has an imaginary value infinite while the real value is limited to the number squeezed between zero and 1 equidistant from the two extremes, which can also be verified by obtaining the mean for the zeta functions with sigma = 0 and 1 when properly added and divided by 2, preserving this relationship even when the series of the corresponding sequences are added. The fact that the tangent has a value equal to the sine of x or x, allows considering that there is an immutable fixed value for the Riemann function that comes from having derivatives in all its points and that when considering the derivative of the limit of x to zero for the circumference gives a fixed value for all possible quantities.

Below are the lines of the program for the zeta (s) function with sigma equals ½ and for sigam equals zero and 1 both divided by 2. With equal graphics as an output:

```
sq=Table[j,{j,1000}]
n=Select[sq,PrimeQ,(100)]
sq2=Table[k,{k,100}] n3=sq2*-
1 r=Table[k1,{k1,100}]
f=(((Pi+1)*r)*Sqrt[(-2*Pi*r)/((Pi+1)*r)])/((Sqrt[(2*Pi*r)^2+2*Pi*r/n]))
ffff=(((Pi+1)*r)*Sqrt[(-2*Pi*r)/((Pi+1)*r)])/((Sqrt[(2*Pi*r)^2+2*Pi*r/2*n3]))
bb=Im[f] bb2=Im[ffff] s1c=((1/2)+bb*r*Sqrt[-1])
s2c2=((1/2)+bb2*r*Sqrt[-1])
zx=n zz=r
```

$$x1c1=\sum_{zx=1}^{100} 1/zx\text{^}s1c$$

VS

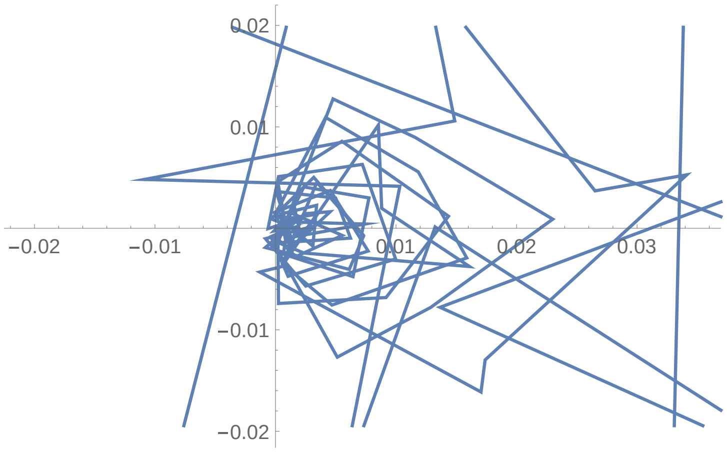
```
sq=Table[j,{j,1000}] n=Select[sq,PrimeQ,(100)] sq2=Table[k,{k,100}]
n3=sq2*-1 r=Table[k1,{k1,100}] f=(((Pi+1)*r)*Sqrt[(-
2*Pi*r)/((Pi+1)*r)])/((Sqrt[(2*Pi*r)^2+2*Pi*r/n])) ffff=(((Pi+1)*r)*Sqrt[(-
2*Pi*r)/((Pi+1)*r)])/((Sqrt[(2*Pi*r)^2+2*Pi*r/2*n3])) bb=Im[f] bb2=Im[ffff]
s1c=(((1)+bb*r*Sqrt[-1])+((0)+bb*r*Sqrt[-1]))/2
s2c2=((1/2)+bb2*r*Sqrt[-1])
zx=n zz=r
```

$$x1c1=\sum_{zx=1}^{100} 1/zx\text{^}s1c$$

```
ListLinePlot[x1c/n]
```

ListLinePlot[Sin[x1c/n]]

$\text{ListLinePlot}[\text{Tan}[\text{x1c}/n]]$

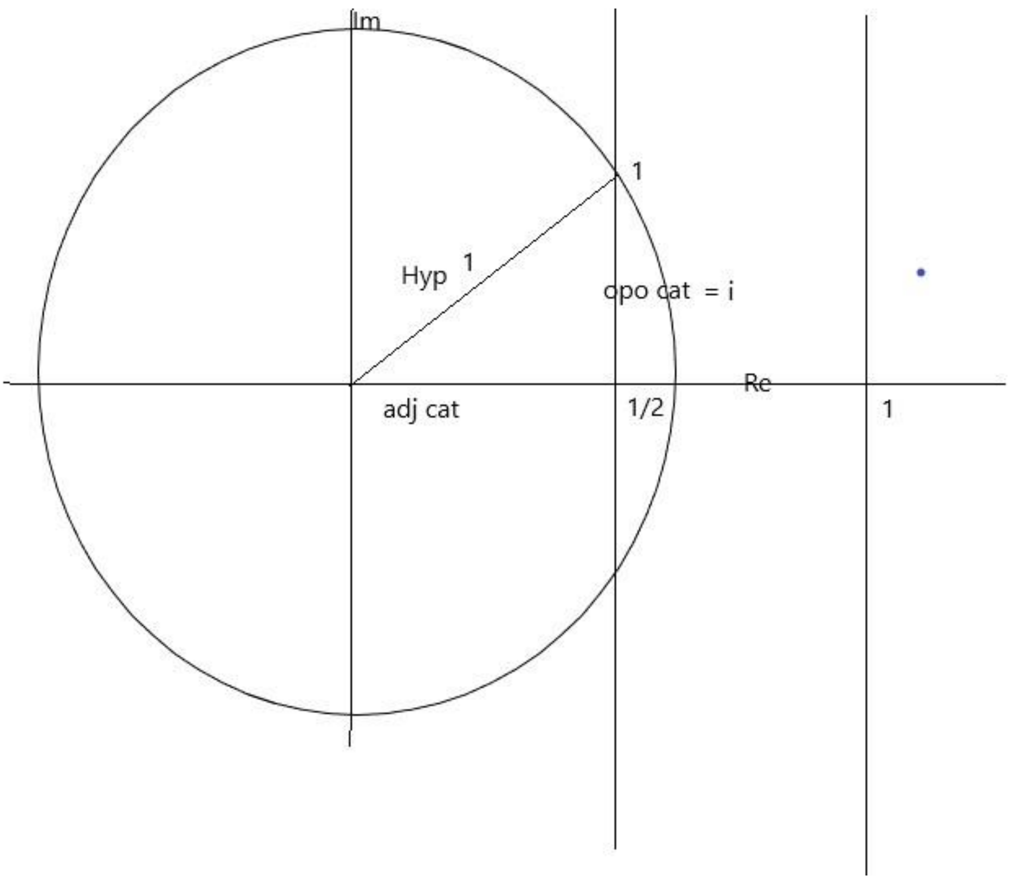


Graphic for $\sum_{zx=0}^{100} \frac{1}{zx \wedge s1}$ /n with sigma for (s) of the zeeta function equals ½, and also the same graphic for Sin $\sum_{zx=0}^{100} \frac{1}{zx \wedge s1}$ /n and for Tan $\sum_{zx=0}^{100} \frac{1}{zx \wedge s1}$ /n with n equals zx

c

c c

equals primes.



$\frac{1}{n^2} \quad \frac{1}{\ } \quad \frac{1}{\ } \qquad \frac{1}{\ } *i = n^{1/2} *_{+n}\ n^{ni}$

$n^{ni} = \cos n + i \sin n$

$\lim_{n\to 0} \frac{\sin n}{n} = 1 => \sin n = n = opo\ cat$

$cos = \frac{\cancel{adj\ cat}}{hyp}$

$\frac{1}{n^{ni}} = \frac{1}{n^{\cos n + ni}} = \frac{1}{n^{\cos n}} * \frac{1}{n^{ni}} = n^{-\cos n} * n^{-ni} => \frac{n^{-\cos n * n - ni}}{n^{\cos n} * n^{ni}} = 1$

$-\cos n - ni = 0 => -\cos n = ni => \frac{adj\ cat}{opo\ cat} = i * opo\ cat => \frac{adj\ cat}{\ } = i * hyp => Tg = hyp$

$i * hyp \quad when\ hyp = 1\ then \quad i = Tg$

$i^{-1} = Tg^{-1} => \frac{1}{i} = CoTg => \frac{1}{i} = CoTg * n$

$$n * 1 = CoTg\ i * n \therefore i = opo\ cat \to i = CoTg = \infty * -1 \quad n \to \infty$$

In the suposition that there must be a value of only “i” to be expressed in the critical line ½ then there must to have a way to prove that the zeta function must be equal the value of i and that this value mus be infinit as proved above. So for this it is described how the value of n_s can be equated to the value “I” that satisfies the need for the expression. of the totality of numbers to be ploted in only one line as it is the case for the Riemann zeta function for sigma equals ½.

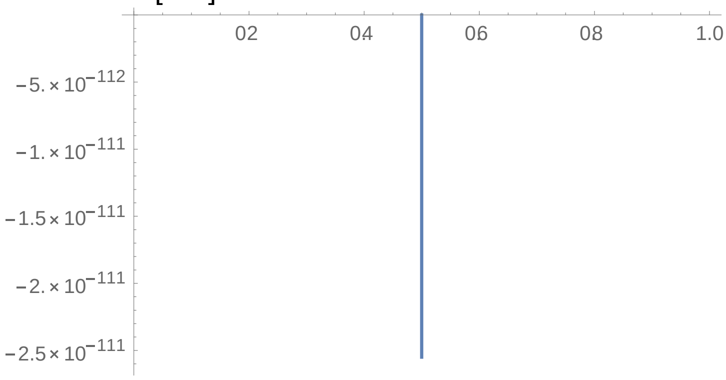
```
sq=Table[j,{j,1000}]
n=Select[sq,PrimeQ,(100)]
n1=Select[sq,PrimeQ,(100)
]
```

$$\sum_{n=1}^{100} \frac{n^{1/2}}{n^2}$$

$$\sum_{n1=1}^{100} 1/(n1^\wedge(n1*Sqrt[-1]))$$

```
a=(n^1/2)/n^2
b=1/(n^n*Sqrt[-1]) x=

x1=
x2=x*x1 x3=(a*b)+1/2
xx=ReIm[x2]
xx2=ReIm[x3]
ListLinePlot[Sin[xx]]
ListLinePlot[xx2]
```



Consider the value of x3^-1 and it should give th positive value for i as the graph is expressed in terms of “y” the imaginary axis and “x” the real value.

The summation of ½ to the equation “$\frac{1}{\frac{1}{n*n2+n*i}}$" is necessery for the graph to be ploted in the position 0.5.

So by following the steps below one can prove that the equation totals a value of “i”, that considered to be the equation in the sum gives a summation of n*i whcih is a necessary value to satisfie the hypothesis that all numbers in the sum of Riemann be ploted in the critical line ½ when considered the summation it is also true, as follows:

$\frac{1}{-}$

$\overline{}$ $121+n*i = \sqrt{\ 2}$ $\overline{ni}$ $\overline{2}$ $\overline{ni}$ +1/2 $nn * n1 = nn2 * n1$

$n*n$

$$\mathcal{L}(s) = \theta +$$

$-it = \frac{}{n^s} = \frac{1}{2} \frac{1}{s}$ n^{it} $it \to -\theta = -s + it * (-1) \to \theta = s - it =>$

n

$\frac{1}{n}$ $\frac{1}{+it} + \frac{}{2} => \frac{1}{n^{\theta+it}} + \frac{1}{n^{-it+s}} = \frac{1}{n^\theta} * \frac{1}{n^{it}} + \frac{1}{n^{-it}} + \frac{1}{n^s} =>$ θ

n

$\underline{nit*ns*nsnns\theta n+\theta nnitsn\theta*nitn\theta}$ $\theta+2s+it + n2\theta+s+it => n\theta n2snit =$

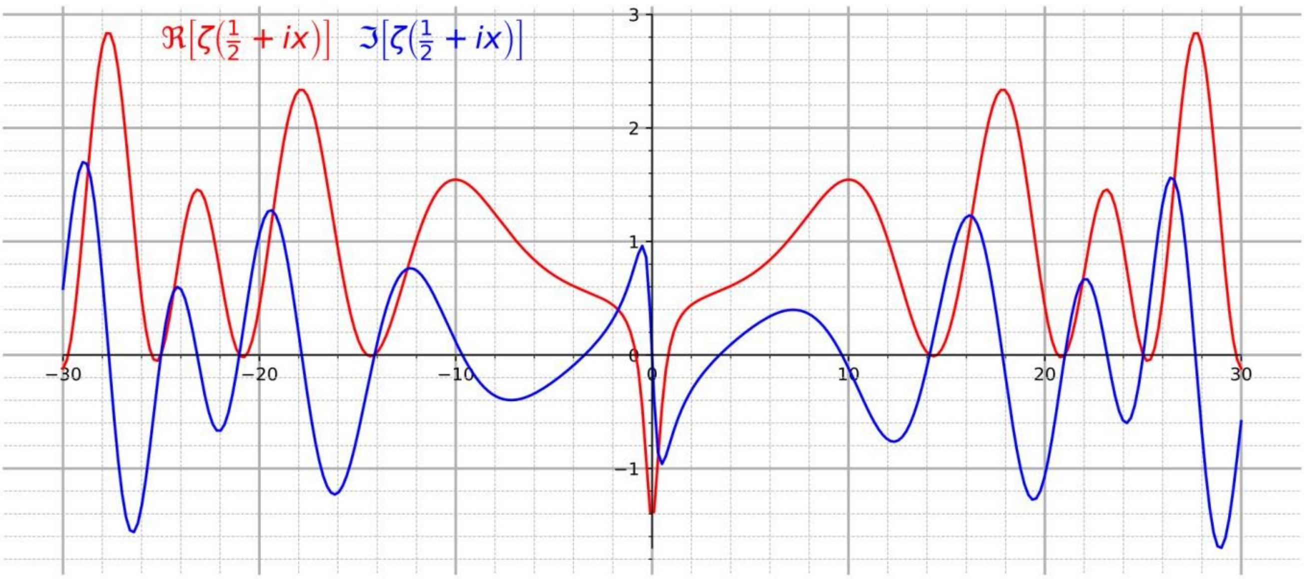
$= n$

$-n2\theta nsnit ==> -\underline{nn\theta 2n\theta 2nssnnitit} = -n\theta n-1 * 1$ $\frac{-n^\theta}{=}$ $= n$

$\frac{-1^\theta}{}$ $that\ for\ \theta = \frac{1}{2}\ this\ equal$ $i\sqrt{-1} =$

OBS: There are 2 possible situations that alows for the result considering s(∞)=1 or $s = 0$ which both satisfie simultaneously the premisse for the non trivial zeros to be plotted at the critical line ½.

Further more consider the graph of the expression of zeta function for the reals and the imaginary numbers when they meet at the zero non trivial point.



If I enlarge the figure and draw a square, I can then establish a proportion between the sides so that a derivable relationship is obtained for the sides of that square.

Observe the yellow lines of the square in the figure below and verify that along the angle of the blue imaginary line representative of the imaginary values of the zeta function it is possible to draw a line inscribed in that yellow square that represents the distortion of the square's proportions when I consider the numbers imaginary which allows me to establish a relationship by defining the derivative between X0 and the same green side "xi" then:

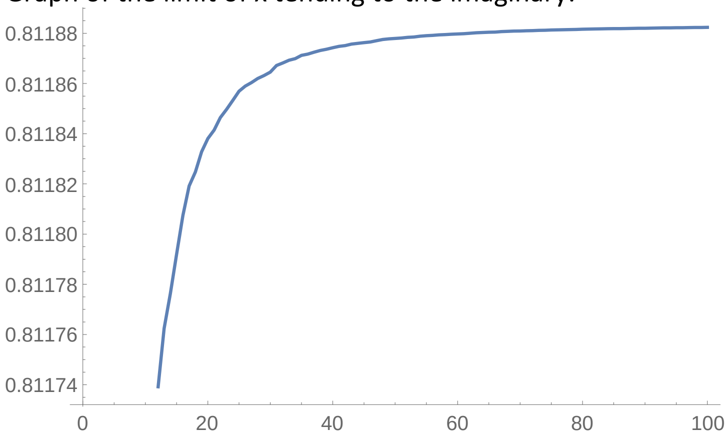
$$\lim_{x \to i} \frac{f(xi+\Delta xi) - f(x^{i})}{\Delta x_0} \quad \frac{0{,}7+3{,}1-0{,}7}{3{,}8} == 0{,}81\ldots$$

Note that the definition of the derivative to the limit has been slightly modified but preserving its proportions since I can both treat Δxi and Δx0 which otherwise considered would simply give me a value of 1 for the derivative which would correspond to the 90-degree sine, thus a rule of three can be established between the value of the derivative and the angle that would directly give me an angle of 81 degrees for the green line referring to the angle of the rise of the blue line that represents the imaginary zeta function of the Riemann equation.

Otherwise, it can be verified that all lines of the graph for both the function of real and imaginary numbers are equal and parallel, there must be a constant derivative that has a value equivalent to the angle of this line that is repeated ad infinitum.

At the beginning of the work, a derivative of x was proposed, tending to the imaginary $\lim_{x \to i} \frac{\sqrt{\frac{-2\pi}{\pi+1}}}{\sqrt{2\pi^2+2\pi}} = \frac{(\pi+1)*\sqrt{\frac{-2\pi}{\pi+1}}}{\sqrt{2\pi^2+2\pi*n}} \blacksquare$ which when computed gives the expected value of 0.8118 for any number considered. Represented below in computer language: $f = (((\mathrm{Pi}+1)*r)*\mathrm{Sqrt}[(-2*\mathrm{Pi}*r)/((\mathrm{Pi}+1)*r)])/((\mathrm{Sqrt}[(2*\mathrm{Pi}*r)^2+2*\mathrm{Pi}*r/n]))$

Graph of the limit of x tending to the imaginary:



Given the fact of being a horizontal asymptote to the value of n, it is noticed that it does not change when n goes to infinity, applying to any number, therefore for all numbers as long as x tends to the imaginary.

By a simple rule of three: $\mathrm{Sin}(90^0)=1$

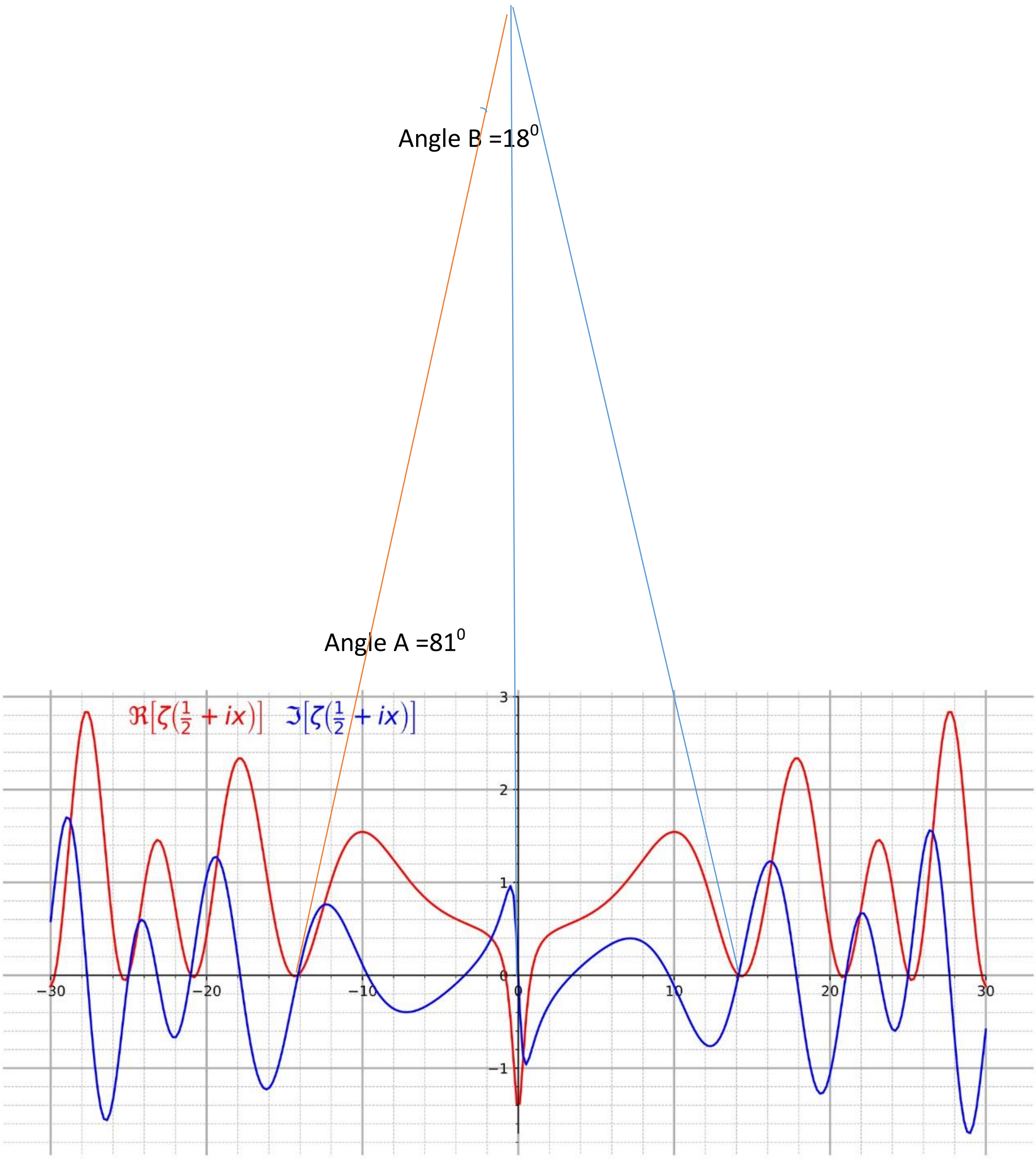
$\mathrm{Sin}(0.8118i)=0{,}9039 \rightarrow 0.9039 * 90 = 81^0$

Which is the angle that forms between the green line and the absciss of the graph for every number when the imaginary part and the real part find each other at the point of the non trivial zeros.

Based on the fact that there is a constancy of the angle formed by the intersection of the graph curve of the Riemann zeta function when the numbers meet in their imaginary and real forms, an isosceles triangle can be drawn from the base to the apex of the corresponding axis to the zero point. The angle of the base of this triangle is equivalent in degrees to the value of the sine of the limit of the derivative when tending to the imaginary and obtained from the proposed calculation for the circumference, previously shown in the publication Riemann`s Hypothesis Solution. The angle shown in the figure below is shown in a simplified way, with no decimal places appearing, which should be considered for obtaining the formula that relates to obtaining the non-trivial numbers that are obtained by the simple fundamental trigonometric relationship that appears when observing a proportion between the base angles (810) to the apex angle (180). By the relation of the sine of these angles, a line of a linear equation can be obtained that relates the numbers relative to non-trivial zeros. So that at the base there will be a number that is equal to twice the non-trivial number, since the absolute value of its positive and negative value is considered, but it is related to an imaginary number corresponding to the height of the isosceles triangle at the real zero point . Thus, a relation of sine values is obtained for the angles that correspond to scalar and vector quantities at the base of the triangle that corresponds to a non-trivial number (related to non-trivial zero numbers), and which remains ad infinitum in a linear relationship that allows obtaining numbers of non-trivial zeros by calculating the arc length by the derivative defined between the ends of the numbers considered in the relation of the magic number 0.9886399220 / 0.29719183431 * n, where the numerator corresponds to the sine of the angle corresponding to the imaginary limit of a circumferential function of value 0.8118i (sine of 0.8118 times 90 = 81.355492 0 = angle A = 0.9886399220), sine of angle A =) and the denominator corresponds to the sine of the apex angle of an isosceles triangle of value (angle B = 17.289016 0 , sine = 0.29719183431).

From the knowledge of a first interval between the encounters of real and imaginary numbers of non-trivial Riemann zeros, a relationship can be established that demonstrates that the definite integral of the lower and upper, negative and positive limits of a given interval corresponds to a number that is a number corresponding to a non-trivial zero, either in terms of whole numbers, or with a small distance of up to 1.5 from the non-trivial zero number for that range.

Thus, knowing that the distribution of non-trivial zeros is related to the distribution of prime numbers, it can be seen that in the second example of calculation on the Wolfram Alpha query page, an integral value equal to 6947316782051176802471116 8 is obtained, which is far from a prime by 5 numbers above, where 69473167820511768024711163 is a prime number. It should be said in passing that the date of this publication is a record for the non-trivial numbers of non-trivial zeros, already obtained.



Length at the base=28,268

Sin 0.8118 *90=81.355492 degrees

Sin(81.355492 degrees)= 0.9886399220

Angle B= 17.289016

Sin A=x ->

Sin B=28.268 (non trivial zero 14.134 times 2)

0.29719183431= 28.286 ->

0.9886399220=x substituting 28.268 by n => x= $\frac{(n*0.9886399220)}{0.29719183431}$

(28.268*n*0.9886399220)/ 0.29719183431=94.096

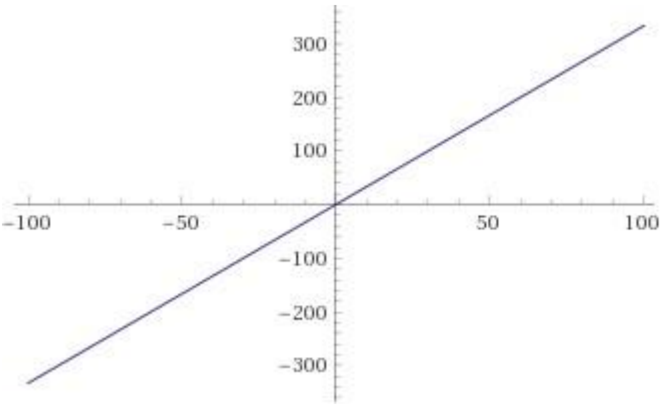
94.096+0.5=94.596 = (non trivial zeros) 94.651344041

The relation might be influenced by the precision of the angles used, whcih is vanished after using the angles with the decimals related.

Input interpretation:

plot	$n \times \frac{0.9886399220}{0.29719183431}$	$n = -100$ to 100

Plot:



- Enlarge Customize

Arc length of curve:

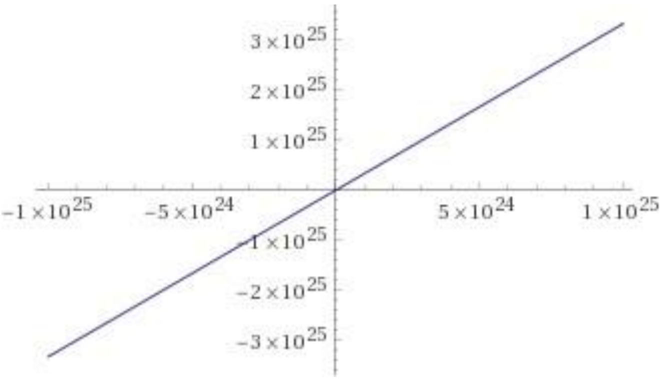
- Step-by-step solution

$$\int_{-100}^{100} 3.47366\, dn = 694.732$$

Non trivial zero 694.533

plot	$n \times \frac{0.9886399220}{0.29719183431}$	$n = -1 \times 10^{25}$ to 1×10^{25}

Plot:



- Enlarge Customize

Arc length of curve:

- Step-by-step solution

$$\int_{-10000000000000000000000000}^{10000000000000000000000000} 3.47366\, dn = 69473167820511768024711168$$

Is there a number whose inverse is equal to the number itself?And how can it be linked to the Riemann Hypothesis ? The link can be stablished and does help to prove that there can´t be other numbers off of the critical line for the given non trivial zeros of the zeta function.

The answer to that question is a surprising yes. These are complex numbers that fit the formula 1 / 〖n * n〗 ^ ((1 + n * n * i)) which, when raised to -1, continue to give the same result:

$$\frac{1}{n*n^{(1+n*n*i)}} = \left(\frac{1}{n*n^{1+n*n*i}}\right)^{-1} = \quad real(-\_i * -1) \quad True$$

Examples:

(1/98*98^(1+98*98*i))= 0.10556682 + 0.994412212 i (1/98*98^(1+98*98*i))^-1=0.10556682 - 0.994412212 i

But they no longer respect the squeeze theorem as it is the case for $\frac{1}{1} = n*n2^{+n*}{}_{n*i}$

$\sin(\frac{1}{\frac{1}{n*n2+}n*n*i})$ $or(\frac{1}{\frac{1}{n*n2+n\,n}**i})^{-1} = sin(\frac{1}{\frac{1}{n*n2+n\,n}**i})^{-1}$ that are the misiecs numbers.

The complex number that are equal to its inverse are the Massena´s numbers , and they are closely related to the Riemann zeta function just like they were married to each other.

$\frac{1}{**} = \frac{a+xi}{(1+n\,n\,i)} = \frac{a+xi}{} * \frac{a-xi}{a+xi} \; a2+22xi-x\,2 + 2xi - x = a2 + x \to x = x \quad - \quad => \to a$ $\frac{n*n}{a+xi}$ $a+x$ i

$= \frac{x}{i} = \frac{x}{\sqrt{-1}} * \frac{\sqrt{-1}}{\sqrt{-1}} = \frac{xi}{1} = xi \therefore x^2 = \frac{x}{i} * xi = x^2 = \quad {}^2 \to x = \pm 1 making\; x =$ x x

$y\; for\; the\; purpose\; of\; graphic\; analysis\; it\; gives\; a\; linear\; graph\; if\; obayed\; the\; rule.$

$$\frac{1}{2(s)} = n^{2s} \quad (\,given\; hypothesis\; and\; result\; in\; yellow)$$
$$n$$

So $x * \frac{1}{x}$-(x-x)=0->$1 - x + x = 0 \to 0 = -1 \therefore \frac{1}{x} * x - (x - x) =$

-1=>$\frac{a+xi}{a-xi} = x * \frac{1}{x} - (x - x) => -1 = \frac{a+xi}{a-xi} - (a + x1 - (a - xi)) =$

$$-1 = -1 - 2xi => 0 = -2xi * \frac{1}{2} => -1 * \frac{1}{2} = -2xi * \frac{1}{2} => -\frac{1}{2} = -$$
$$=> xi = \frac{1}{2} \qquad xi$$

Stablishing $a + xi = -(a - xi) => a + xi = -a + +xi => 2a = 0; 0 =$

$-1;\; a \quad \frac{0}{2} \quad \frac{1}{2} \quad \frac{-\frac{1}{2}+xi}{-\frac{1}{2}-xi} \quad \frac{1}{2} \quad \frac{1}{2}$

$= - => a = -- => \frac{\frac{2}{1}}{} = -1 => -- + xi = - + xi \to -\frac{1}{2} -$

$\frac{1}{} \qquad = 0 * \qquad \frac{-(a+xi)}{}(-1) => -1 = 0\; or\; 1$

$> -a = \frac{= 0\; ; = 1 \to -a - xi = a - xi =}{2a-xi}$

a

$x \quad - \quad - \quad = \frac{*x-\left(x*\frac{1}{}\right)}{} \quad 1$

$\rightarrow x \rightarrow x-1=0 \rightarrow x*x$

$-(x*1 \;\; x \quad x$

$=0\;)=$

$x \quad x \quad x \quad 2$

$\rightarrow if\ it\ is\ true\ for\ infinit\ numbers\ x\ for\ the\ real\ part\ of\ a\ conjugate\ pair\ with\ real\ part$
$\in \mathbb{Z}\ then\ there\ is\ a\ solution\ for\ infinit\ numbers\ of\ a\ real\ part\ \ x=a+xi\ ou\ a-xi$

$$\rightarrow (\frac{+xi\ -(\frac{1}{(a+xi)})-(a+xi-(a-xi))}{2}=0\ when\ a=1/2$$

$$\frac{1}{2}\left(\left(a+\xi-\left(\frac{1}{a}+\xi\right)\right)-(a+\xi-(a-\xi))\right)=0$$

Result:

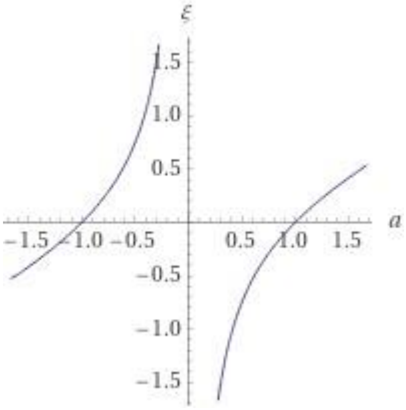
$$\frac{1}{2}\left(a-\frac{1}{a}-2\,\xi\right)=0$$

Geometric figure:

- Properties $\quad a$

hyperbola

Implicit plot:



Alternate form assuming a and ξ are real:

$$a = \frac{1}{a} + 2\xi$$

Alternate forms:

$$a\xi = \frac{a^2}{2} - \frac{1}{2}$$

$$\frac{a^2 - 2a\xi - 1}{2a} = 0$$

- Enlarge
- Customize
- Plain Text

Alternate form assuming a and ξ are positive:

$$a^2 = 2a\xi + 1$$

Expanded form:

- Step-by-step solution

$$\frac{a}{2} - \frac{1}{2a} - \xi = 0$$

Solution:

$$a \neq 0, \quad \xi = \frac{a^2 - 1}{2a}$$

Integer solution:

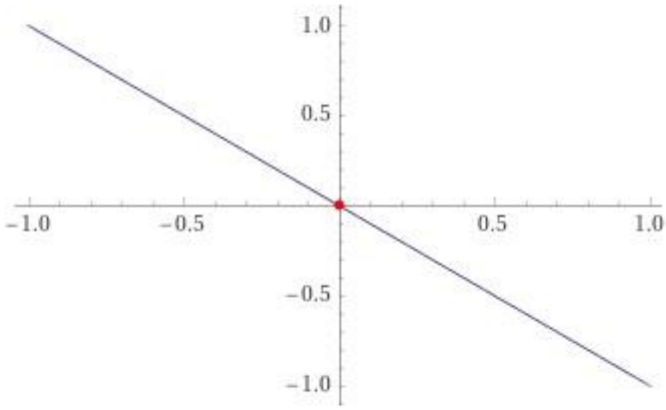
$a = \pm 1, \quad \xi = 0$

$$\frac{1}{2}\left(\left(\frac{1}{2} + \xi - \left(\frac{\frac{1}{1}}{2} + \xi\right)\right) - \left(\frac{1}{2} + \xi - \left(\frac{1}{2} - \xi\right)\right)\right) = 0$$

Result:

$-\xi = 0$

Root plot:



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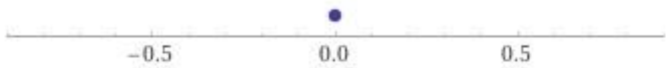
mize

Number line:



Solution:

- Step-by-
step
solution
 $\xi = 0$

The linear graph is compatible at zero is compatible with a linear solution for infinit numbers with ½ as the real part, not allowing for secondary non trivial zeros outside of the line of the graph, thus proving that there are no other zeros outside the critical line.

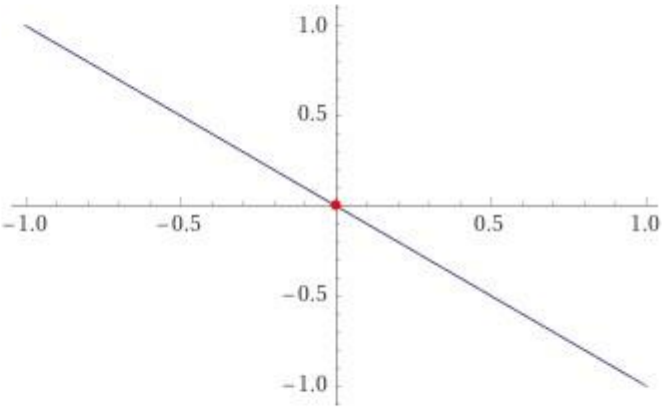
If it is continued to be obtained the value of half for the real part of other number than ½ as ¼ it continues to keep the linear relation wich vanishes as the proportion is kept to the same proportion of the real part ¼,3/4,etc...

$$\frac{1}{2}\left(\left(\frac{1}{4}+\xi-\left(\frac{1}{\frac{1}{4}}+\xi\right)\right)-\left(\frac{1}{4}+\xi-\left(\frac{1}{4}-\xi\right)\right)\right)=0$$

Result:

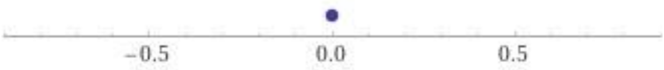
$-\xi = 0$

Root plot:



- Enlarge Custo
mize

Number line:



Solution:

- Step-by-step solution

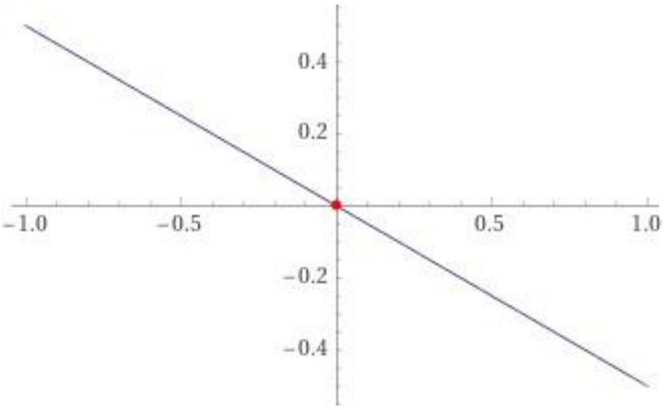
$\xi = 0$

$$\frac{1}{4}\left(\left(\frac{1}{4}+\xi-\left(\frac{1}{\frac{1}{4}}+\xi\right)\right)-\left(\frac{1}{4}+\xi-\left(\frac{1}{4}-\xi\right)\right)\right)=0$$

Result:

$-\frac{\xi}{2} = 0$

Root plot:



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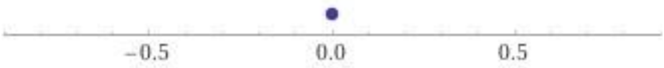
Number line:



Solution:

- Step-by-
  step
  solution

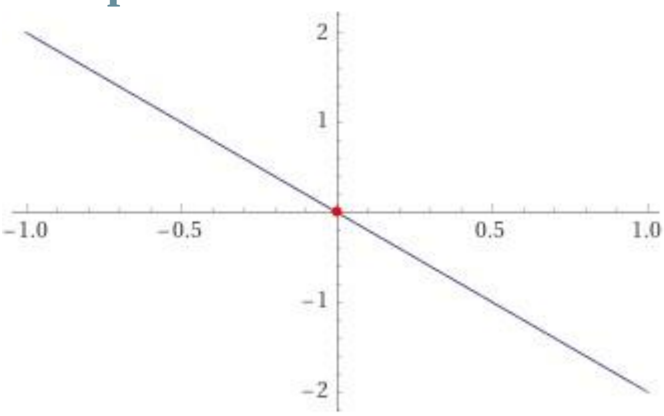
$\xi = 0$

$$\left(\frac{3}{4}+\xi-\left(\frac{3}{4}+\xi\right)\right)-\left(\frac{3}{4}+\xi-\left(\frac{3}{4}-\xi\right)\right)=0$$

Result:

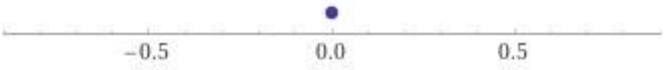
$-2\,\xi = 0$

Root plot:



- Enlarge
  Custo
  mize

Number line:



Solution:

- Step-by-step solution

$\xi = 0$

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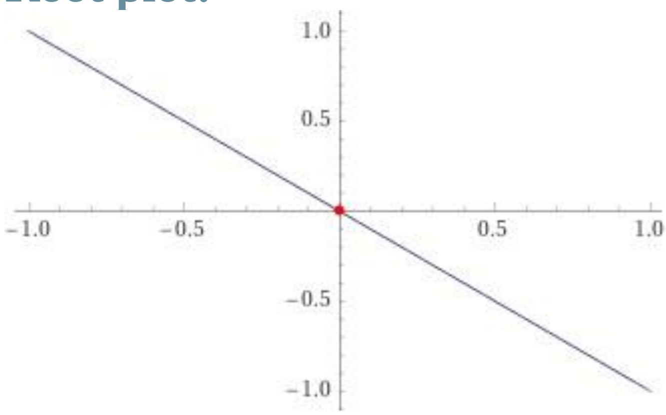
$$\frac{1}{2}\left(\left(\frac{3}{4}+\xi-\left(\frac{3}{4}+\xi\right)\right)-\left(\frac{3}{4}+\xi-\left(\frac{3}{4}-\xi\right)\right)\right)=0$$

Result:

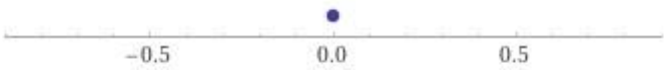
$-\xi = 0$

Root plot:



- Enlarge
- Customize

Number line:



Solution:

- Step-by-step solution

$\xi = 0$

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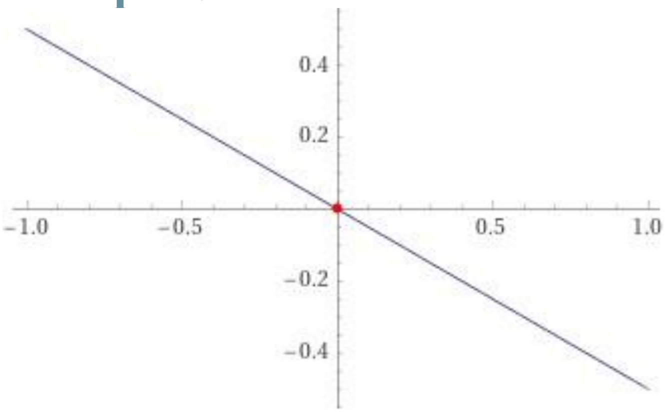
$$\frac{1}{4}\left(\left(\frac{3}{4}+\xi-\left(\frac{3}{4}+\xi\right)\right)-\left(\frac{3}{4}+\xi-\left(\frac{3}{4}-\xi\right)\right)\right)=0$$

Result:

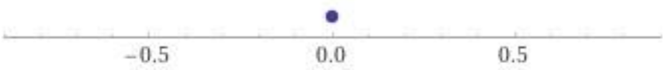
$$-\frac{\xi}{2}=0$$

Root plot:



- Enlarge
  Custo
mize

Number line:



Solution:

- Step-by-
step
solution

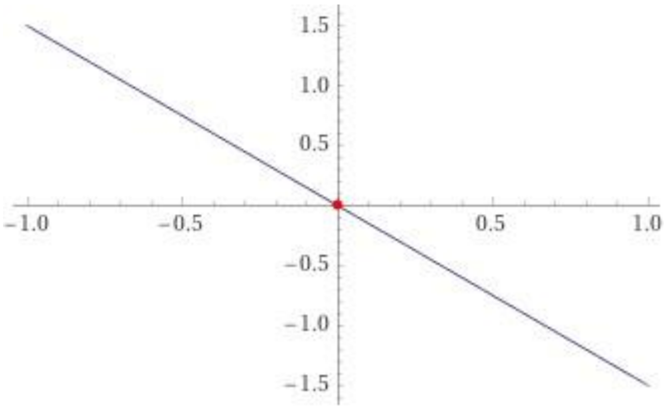
$\xi = 0$

$$\left(\left(\frac{3}{4}+\xi-\left(\frac{3}{4}+\xi\right)\right)-\left(\frac{3}{4}+\xi-\left(\frac{3}{4}-\xi\right)\right)\right)\times\frac{3}{4}=0$$

Result:

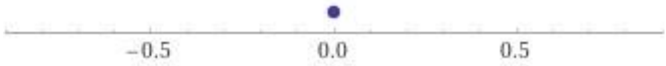
$$-\frac{3\,\xi}{2}=0$$

Root plot:



- Enlarge Customize

Number line:



Solution:

- Step-by-step solution

$\xi = 0$

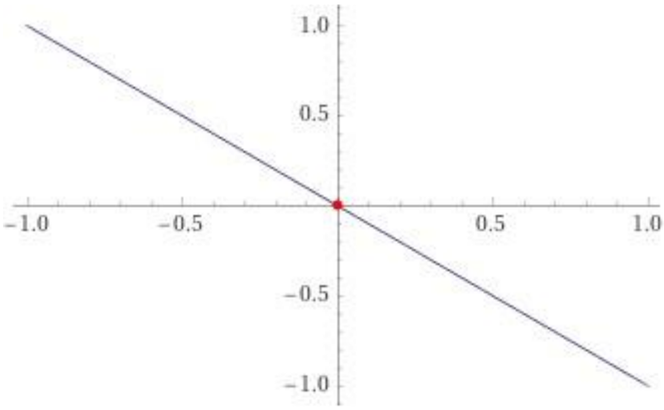
That is not expected for a whole number belonging to Z thus not respecting the logic of the statement that says that if there is a number that has the same value of its inverse, then the difference between that number and its inverse must be zero, so avoiding the possiblity for other numbers different from ½ be considered in the proof.

$$\frac{1}{2}((1+\xi-(1+\xi))-(1+\xi-(1-\xi)))=0$$

Result:

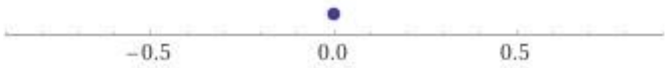
$-\xi = 0$

Root plot:



- Enlarge
  Customize

Number line:



Solution:

- Step-by-step solution

$\xi = 0$

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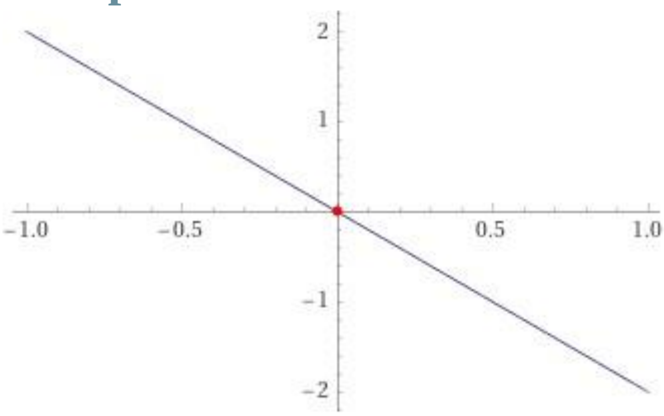
$$\frac{(1+\xi-(1+\xi))-(1+\xi-(1-\xi))}{1}=0$$

Result:

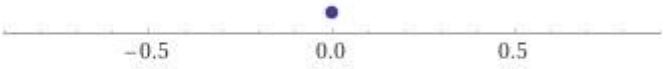
$-2\,\xi = 0$

Root plot:



- Enlarge
- Customize

Number line:



Solution:

- Step-by-step solution

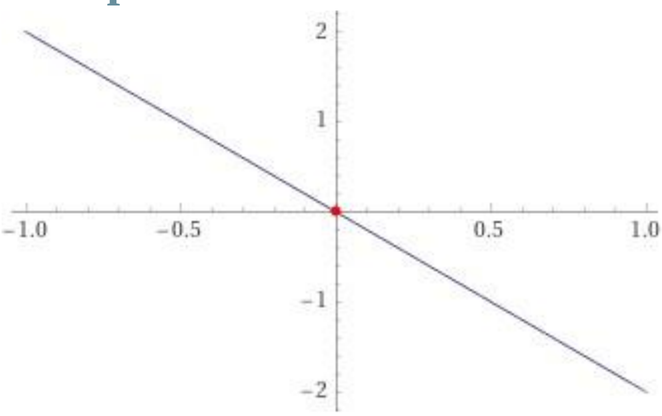
$\xi = 0$

$$\frac{(0+\xi-(0+\xi))-(0+\xi-(0-\xi))}{1} = 0$$

Result:

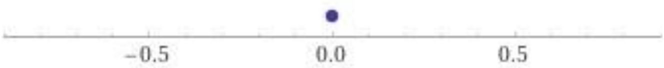
$-2\,\xi = 0$

Root plot:



- Enlarge Customize

Number line:



Solution:

- Step-by-step solution

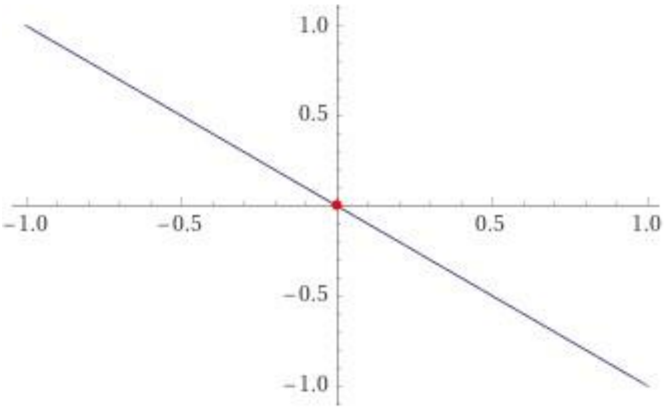
$\xi = 0$

$$\frac{1}{2}((0+\xi-(0+\xi))-(0+\xi-(0-\xi))) = 0$$

Result:

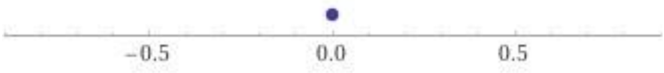
$-\xi = 0$

Root plot:



- Enlarge Custo
mize

Number line:



Solution:

- Step-by-step solution

$\xi = 0$

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So analysing the graphs it becomes clear that the necessary linear relation of " green", to be true it must be multiplied by the value of ½ that can be atributed for "a" in a+xi, as the value of theta, of the zeta function, other wise the infinit linear relation for the non trivial zeros to lay over the critical line ½ is contradicted.

$$\zeta = \theta + xi*(xi); xi = \frac{1}{2}$$

$$= \theta xi + xi^2 => \frac{1}{2\zeta} - \frac{\theta 1}{2} + \frac{1}{4} => 4\left(\frac{\zeta}{2} - \frac{\theta}{2}\right) = 1 => 2\zeta - 2\theta = 1 => \zeta - \theta = \frac{1}{2} =$$

$$\zeta * xi \qquad > \zeta - \frac{1}{2} = \frac{1}{2}$$

$\zeta = \frac{1}{2} + \frac{1}{2}$=1 satisfying the need for the assumption that a number is equal its inverse and that the value of theta in the zeta function be equal ½

So analysing the graphs it becomes clear that the necessary linear relation of " green", to be true it must be multiplied by the value of ½ that can be atributed for "a" in a+xi, as the value of theta, of the zeta function, other wise the infinit linear relation for the non trivial zeros to lay over the critical line ½ is contradicted.

$\zeta = \theta + xi * (xi); xi = \frac{1}{2}$

$^2 => 1 - \theta 1 + 1 => 4\,(\zeta - \theta) = 1 => 2\zeta - \frac{}{2}\ \frac{}{2}\quad 2\theta = 1 => \zeta - \theta = 1\quad \frac{}{2} =$

$\zeta * xi = \theta xi + xi$

$2\zeta\quad 2\quad 4$

$> \zeta - \frac{1}{2} = \frac{1}{2}$

$\zeta = \frac{1}{2} + \frac{1}{2}$ =1 satisfying the need for the assumption that a number is equal its inverse and that the value of theta in the zeta function be equal ½.

Now it remains to prove that there is a relationship between the multiplication→

$\left(\frac{a+xi - \left(\frac{1}{(a+xi)}\right) - (a+xi-(a-xi))}{}\right. * \theta$ that manages the zeta (s) function to then relate to the value

1

of s in $\sum_{1}^{\infty} \frac{1}{n^s}$ and then tell me if there is an infinite relationship, which can be done by replacing xi with x / i which are identical.

$s = \theta + \frac{x}{i} => is = \theta i + x * (\theta) => i\theta s = \theta^2 i + \theta x \to \theta = \frac{1}{2} => \frac{is}{2} = \frac{i}{4} + \frac{x}{2}$

$2is = i + 2x => 2is - i = 2x => s = \frac{i + 2x}{2i} => s = \frac{i}{2i} + \frac{2x}{2i} = \frac{1}{2} + \frac{x}{i} \therefore s = \frac{1}{2} + xi$

$i\theta s = \theta^2 i + \theta x\ * (\theta); \theta = \frac{1}{4} => i\frac{1}{4}s = \frac{1i}{16} + \frac{1x}{4} => 4is = i + 4x => s = \frac{i+4x}{4i} => s = \frac{i}{4i} +$

$\frac{4x}{4i} = s = \frac{1}{4} + \frac{x}{i} => \frac{1}{4}\ s = + xi$ so it is shown that the multiplication by theta with different values shown in graphs above is equivalent as changing the values of theta for the zeta function here considered to be s. So it is possible to consider the analysis of the linearity of the graphs for different values of theta, and conclude that the linearity required for the deduction through the logical steps proposed before to be truly linear must have theta of equals ½ , that makes the function of the misiec´s zeta numbers . $\frac{1}{\frac{1}{n*n2} + n * n * i} = \frac{1}{n^s}$ value

Thus given the fact that the last form

1

$\frac{}{n}{}_s$ *gives a divergent to infinity result, it is proven that they all lay over the critical line*

If i consider that $\frac{1}{(1+n*n*i)} = \frac{a+xi}{*} \frac{a+xi}{=2} \frac{a^2+2xi-x}{} \to a^2 + 2xi - x = a^2 +$ $\frac{n*n}{a+xi}$ $\frac{a-xi}{a+x}$

$x \to x = \frac{x}{} => i$

$= \frac{x}{i} = \frac{x}{\sqrt{-1}} * \frac{\sqrt{-1}}{\sqrt{-1}} = \frac{xi}{1} = xi \therefore x^2 = \frac{x}{i} * xi = x^2 = \quad {}^2 \to x = \pm 1 making\ x =$

$x \qquad x$

$y\ for\ the\ purpose\ of\ graphic\ analysis\ it\ gives\ a\ linear\ graph\ if\ obayed\ the\ rule.$

then I can consider that the division of the summation of the conjugates will also yield correspondent values that have specific properties as it can be demonstrated:

$$\frac{a-bi}{\cancel{a+bi}} = a - bi = a + bi \to 2bi = 0\ so\ \frac{1}{2} - bi - \frac{1}{2} - bi = 0 - 2bi\ or\ 0 - \frac{2b}{i}$$

$$\to -\frac{2b}{i} = -0 * (-1) => b$$

$= \frac{\bar{i}}{2}$ *when real part equals* $\frac{1}{2}$ *and the sum equals zero as is the case for the non trivial* 2

Zeros. Rewriting $a - bi = a + \frac{b}{i} => ai - ai - bi^2 - b = b - b = 0\ so\ b = \frac{i}{i2}$ $in\ a + bi$ $= a - \frac{1}{2} \to a = real\ part\ \frac{1}{2} \to + bi = \frac{1}{2} - \frac{1}{2} = 0$ non trivial zero.

$$a\ \frac{\left(\sum_1^\infty \frac{1}{\frac{1}{n^2}+n*n*i}\right)_{Real} - \left(\sum_1^\infty \frac{1}{\frac{1}{n^2}+n*n*i}\right)_{Imaginary}}{\left(\sum_1^\infty \frac{1}{\frac{1}{n^2}+n*n*i}\right)_{Real} + \left(\sum_1^\infty \frac{1}{\frac{1}{n^2}+n*n*i}\right)_{Imaginary}} =$$

So 0 for specific values of the imaginary part that satisfies the condition for the subtraction of a conjugate pair that are equal resulting in a zero value, as shown in the plot blow the lines of the program, that uses as exponent the multiplication of an integer times the limit of the value of x when x tends to the imaginary. After correction of the value, in the second lines of the program and as shown in the graph of the result, where it is found a value of aproximate ½ for all the prime numbers used in the calculus. The precision of the first graph below is then corrected for the real value of 0.500... and the values of the plot coinicide after correction with either the peaks or with the crossing of the abscissa with the axis of the ordinates at the y-axis value of zero. See scracth below where it is shown the values of the plot corrected to cm related to te real values given in the plot.

Detail: the "n" is given by "zx" , in program lines below and the "n" in the exponent is given by the value of the limit of the derivative to the imaginary of 2Pir multiplied by na integer, as follows.

sq=Table[j,{j,1000}] n=Select[sq,PrimeQ,(100)]

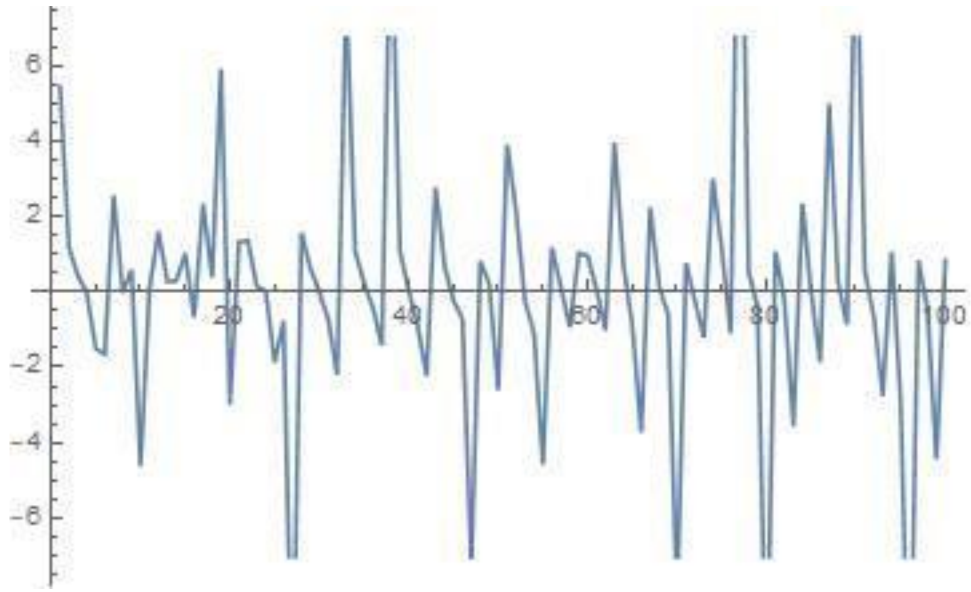
$f = (((\mathrm{Pi}+1)*r)*\mathrm{Sqrt}[(-2*\mathrm{Pi}*r)/((\mathrm{Pi}+1)*r)])/((\mathrm{Sqrt}[(2*\mathrm{Pi}*r)\hat{}2+2*\mathrm{Pi}*r/n]))$

$\mathrm{bb} = \mathrm{Im}[f]$ $\mathrm{s1cc} = (((1)+\mathrm{bb}*r*\mathrm{Sqrt}[-1]) + ((0)+\mathrm{bb}*r*\mathrm{Sqrt}[-1]))/2$ zx=n

x1c1c= $\sum_{zx=1}^{100} 1/zx * zx\hat{}s1cc$

x1cc1=Re[x1c1c]
x1cc2=Im[x1c1c] $\mathrm{proof} = (\mathrm{x1cc1} - \mathrm{x1cc2})/(\mathrm{x1cc1} + \mathrm{x1cc2})$

ListLinePlot[proof]



It is important to notice that the substitution of the values of zx (primes) by zz (integers) will result in the same graph above (proof), allowing to stablish a correlation between the graphs that leads us to think that it is possible to determine by the "proof " calculation, the numbers of the non trivial zeros and and correlated primes from integers, verifying its distributions and patterns.

Correlation between the graph numbers and the length in centimeters in a rule of 3; nontrivial zeros at left and corrected length in cm for the non trivial zeros at right:

15 (graph value) -------18 cm (ruler)

Non trivial zero Length (ruler)

1-14.134 =16.96---0.50469(value for correction as seen in the graph below)---0.5000(perfect ½= 16.8 cm length corrected.

2-20.0220 -------25cm

3-25.018----------29.75cm

4-30.42-----------36.19cm

5-32.935----------39.18cm

6- 37.586----------44.79cm

7- 40.918---------48.68cm

8-43.327-----------51.54cm

9-48.005----------57.11cm

10-49.77-----------59.21cm

11-52.97-----------63.02cm

12- 56.446---------67,15cm

13- 59,34-----------70.60cm

14-60.831----------72.37cm

15-65.112----------77.46cm

16-67.0798---------79.80cm

17-69.546------------82.74cm

18-72.067-----------85.74cm

19-75.7046----------90.07cm

20-77.144------------91.78cm

21- 79.3373----------94.39cm

22- 82.910------------98.64cm

23- 84,735-----------101.81cm

24- 87.425------------104.01cm

25-88.809-------------105.66cm

26-94.651-------------112.61cm

27 -95.870------------114.06cm

28-98.8311------------117.586cm

The proof that it maintains the relation to the non trivial zeros relies in the next rpogram lines with it according

Graph both of the riemann zeros and the x1cc1=Re[x1c1c] x1cc2=Im[x1c1c] $\text{proof} = (\text{x1cc1} - \text{x1cc2})/(\text{x1cc1} + \text{x1cc2})$ relation:

Program lines :

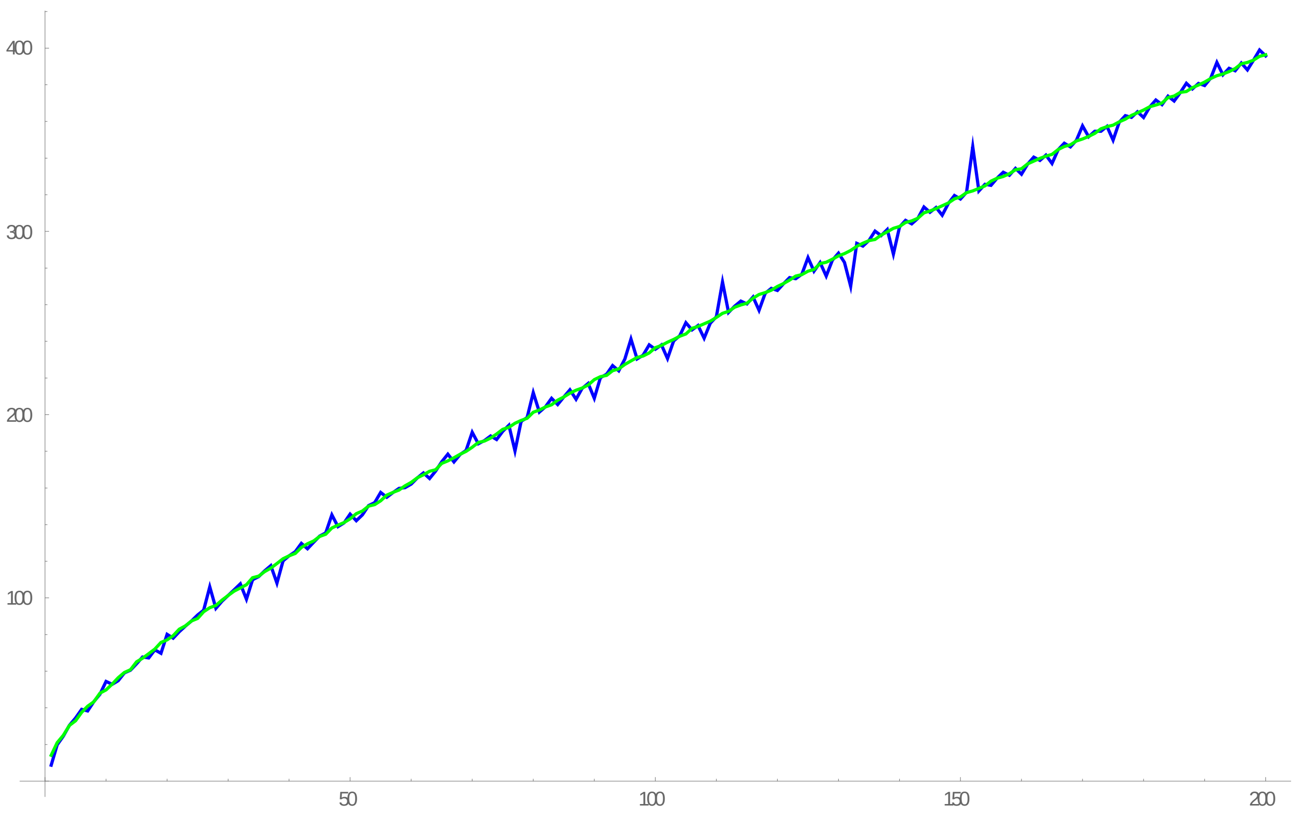
```
sq=Table[j,{j,10000}]

n=Select[sq,PrimeQ,(200)]

sq2=Table[k,{k,200}]

n3=sq2*-1

r=Table[k1,{k1,200}]

f=(((Pi+1)*r)*Sqrt[(-
2*Pi*r)/((Pi+1)*r)])/((Sqrt[(2*Pi*r)^2+2*Pi*r/
n]))

bb=Im[f]

s1cc=(((1)+bb*r*Sqrt[-1])+((0)+bb*r*Sqrt[-
1]))/2

zz=-n3

zx=n

x1c1c=\!\(
\*UnderoverscriptBox[\(\[Sum]\), \(zx = 1\),
\(100\)]\((1/zx*zx^s1cc)\)\)

jj=Sum[1/zx*zx^s1cc,{2,541}]

u=N[jj]

k=N[x1c1c]
```

```
x1c1c2=\!\(
\*UnderoverscriptBox[\(\[Sum]\), \(zz = 1\),
\(100\)]\((1/zz*zz^s1cc)\)\)
kk=N[x1c1c2]
x1cc1=Re[x1c1c]
x1cc2=Im[x1c1c]
x1c=Re[x1c1c2]
x1c2=Im[x1c1c2]
proof3=Table[Im[ZetaZero[n]]//N,{n,200}]
bg=Mean[%]
proof2=(x1c-x1c2)/(x1c+x1c2)
proof=(x1cc1-x1cc2)/(x1cc1+x1cc2)
g=proof-proof2
gh1=proof3-proof2
bh=Mean[%]
lk=(bg+bh)/2
gh=(gh1+proof3)
jóia=gh-gh1
aa=Plot[RiemannSiegelZ[t],{t,0,200}]
bb=ListLinePlot[proof,PlotStyle->Blue]
cc=ListLinePlot[proof3,PlotStyle->Green]
dd=ListLinePlot[gh1,PlotStyle->Blue]
ee=ListLinePlot[jóia,PlotStyle-> Red]
Show[aa,cc,dd]
Show[dd,cc]
Show[dd,ee]
Show[aa,bb]
proofN = gh // N;
peaks = FindPeaks[proofN];
```

zeros = CrossingDetect[proofN]*Range@Length@proofN // Thread[{#, 0}] & // DeleteCases[{0, 0}];

ListLinePlot[proofN,
 PlotRange -> All,
 Epilog -> {Red, Point@peaks, Blue, Point@zeros},
 ImageSize -> Large]
N[ZetaZero[1-100]]

Grapjic results color related to the lines in hghlighted colors:



The non trivial zeros are just realocated further on the graph (base line of the spike blue graph) but remain related to the zeros of the rieman zeta function in green.

Note: The above values correspond to the encounter of the ordinate axis with the abscissa or to the peaks in the graphs and tey allways match with the non trivial zeros values on the abscissa

.

Sketch below correlates to the points in the graph numbered as the non trivial zeros plots and they are allways very precisely located:

On the sketch given below it is possible to notice that there are 12 points related to the non trivial zeros that coincide with the abcissa and the rest of the points is located in exact points of the peaks of the graph in a total of 16 peaks. If it is considered the length or height of these peaks then it is possible to relate their height to the proximity of the value of half that is the real part of the zeta function , so that considering their signs when up or down, it will give if summed the value of zero for the total sum even though they differ in heights. And those peaks probabily are related to the distance of the prime numbered considered in the equation that defines the graph to the original non trivial zero closely related. It also reveals tht the peaks either positive or negative correspond to the distance between primes or to the relative mean value of the non prime numbers in between the primes.

Roughly speaking it follows the summation of the gaps between primes in blocks of 10 numbers to correlate withthe spikes at the given graph:

1-10 9/3=3 (8+9+10/3)/3

10-20 5

20-30 8.12

30-40- 6.8

40-50 5

50-60 11.2

60-70 12.8

70-80 15.2

80-90 17.2

90-100 13.28

5 — 6
15 = 18
(1) 14.184 = 16.96 — 0,50469   0,5 — (16,8)
(2) 20.0220 = 25.22   25,22 — 0,50435
(03) 25.018 = 30.012   (25) — 0,5
30.012 — 0,5043
29,75 — 0,5

sq=Table[j,{j,1000}]
n=Select[sq,PrimeQ,(100)]

f
= (((Pi + 1) * r) * Sqrt[(−2 * Pi * r)/((Pi + 1) * r)])/((Sqrt[(2 * Pi * r)^2 + 2 * Pi * r/n]))

bb = Im[f]

s1cc = (((1) + bb * r * Sqrt[−1]) + ((0) + bb * r * Sqrt[−1]))/2

zx=n

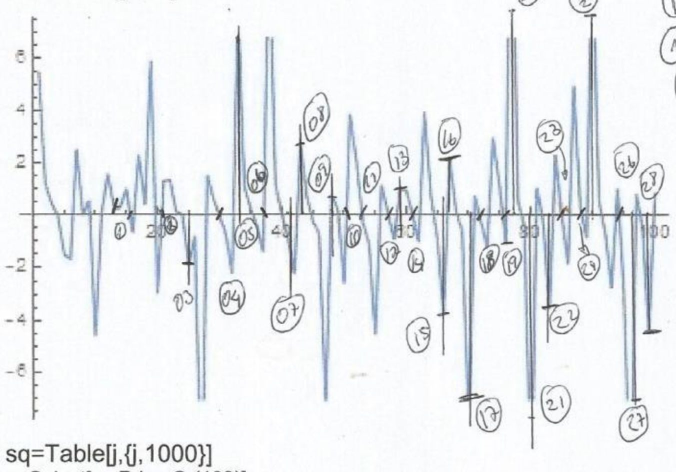
x1c1c= $\sum_{zx=1}^{100}$ 1/ zx* zx^s1cc

x1cc1=Re[x1c1c]
x1cc2=Im[x1c1c]

proof = (x1cc1 − x1cc2)/(x1cc1 + x1cc2)

ListLinePlot[proof]

(04) 36,19 =
30,42
(05) 32,935 = 39,18
37,586 = 44,71
(06) 40,918 = 48,68
(07) 43,327 = 51,54
(08) 48,005 = 57.11
(09) 49.77 = 59.21
(10) 52.97 = 63.02
(11) 56.446 = 67,15
(12) 59,34 = 70,60
(13) 60,831 = 72,37
(14) 65,112 = 77,46
(15) 67,0791 = 79,80
(16) 67,546 = 82.79
(17) 72,067 = 85.74
(18) 75,7046 = 90.07
(19) 77.144 = 91,78
(20) 79,3373 = 94,39
(21)



sq=Table[j,{j,1000}]
n=Select[sq,PrimeQ,(100)]

f
= (((Pi + 1) * r) * Sqrt[(−2 * Pi * r)/((Pi + 1) * r)])/((Sqrt[(2 * Pi * r)^2 + 2 * Pi * r/n]))

bb = Im[f]

s1cc = (((1) + bb * Sqrt[−1]) + ((0) + bb * Sqrt[−1]))/2

zx=n

x1c1c= $\sum_{zx=1}^{100}$ 1/ zx+ zx^s1cc

x1cc1=Re[x1c1c]
x1cc2=Im[x1c1c]

proof = ((x1cc1 − x2cc1)/(x1cc1 + x2cc1) − 0.8118) * −1

(22) 82,910 = 98,64
(23) 84.735 = 101,81
(24) 87.425 = 104,01
(25) 88.809 = 105.66
(26) 94,651 = 112.61
(27) 95,870 = 114,06
(28) 98.8371 = 117.586

sq=Table[j,{j,1000}] n=Select[sq,PrimeQ,(100)]

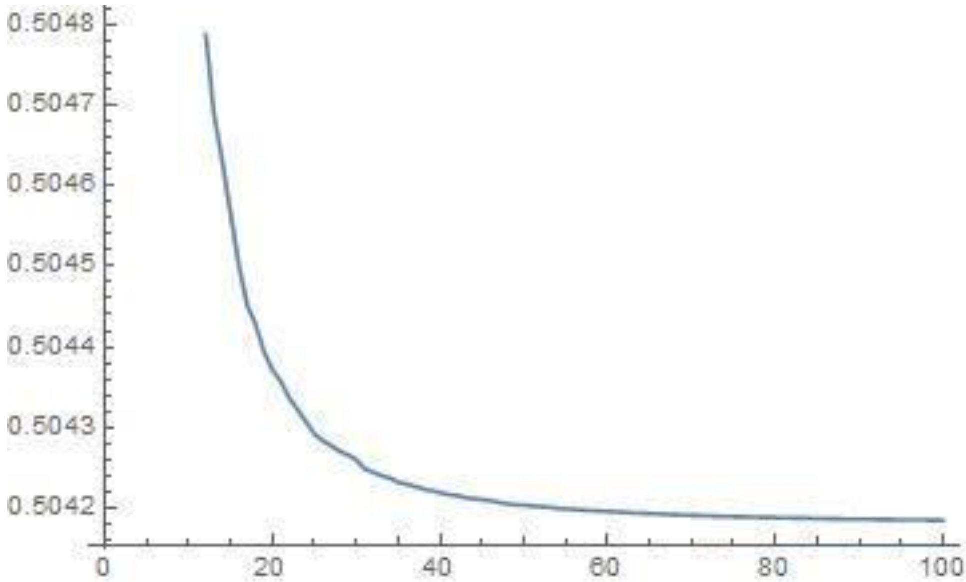
f
= (((Pi + 1) * r) * Sqrt[(−2 * Pi * r)/((Pi + 1) * r)])/((Sqrt[(2 * Pi * r)^2 + 2 * Pi * r/n])) bb = Im[f]

s1cc = (((1) + bb * Sqrt[−1]) + ((0) + bb * Sqrt[−1]))/2 zx=n

x1c1c= $\sum_{zx=1}^{100} 1/zx * zx\text{^}s1cc$

x1cc1=Re[x1c1c]

x1cc2=Im[x1c1c] $\text{proof} = ((\text{x1cc1} - \text{x2cc1})/(\text{x1cc1} + \text{x2cc1}) - 0.8118) * -1$



Thus the conjugates of the summation divide by each other gives the values of the non trivial zeros ,as it can be seen in the graph above and also explained, as it behaves in the same manner as the correlation of simple complex numbers conjugate exploited in more details in te lines in green in the given text above.

The non prime gets converted to a numerator that is the prime factor of the factorization product.

Comparing the limits of the summation of two distinguished equations , one of the Riemann sum with the sum of an equation that results in many possible primes and number ended in 1,3,7 and 9 if the number -1 is changed to either 3,7,9 then due to the fact that it both gives results that if summed give zero as needed for the non trivial zeros then by following reasoning it can be proven by the fact that the trivial zeros using the same equation when divided by n or x gives gives zero and due to the fact that the same equation gives results of ½ using the same analogy it is proven that these equation keep a relation that is responsible to explain the behavior of the zeta function and its both trivial and non trivial zeros .

$$\lim_{s\to 0}\left(\sum_{n=1}^{\infty} n^{-s}\right) = -\frac{1}{2}$$

$$\lim_{s\to 0}\left(\sum_{n=1}^{\infty} (n^8 + n^4 - 1)\, n^{-s}\right) = \frac{1}{2}$$

$$\zeta(0) = \frac{1}{2} + xi \Rightarrow xi = -\frac{1}{2}$$

$$xi = x8 + x4 - 1 \Rightarrow i = \frac{x3(x5 + x) - 1}{x} = -\frac{1}{2}$$

$$2x_3(x_5 + x) - 2\ 1\ 3(x^5 + x) - 1 = i \Rightarrow 2x^8 + 2x^4 -$$

$$1 = -i = - \Rightarrow 2x$$

$$2x \qquad 2x$$

$$+ 2x \quad = 1 - i \Rightarrow 2x\ \ (x \quad + 1) = 1 - i \Rightarrow x \quad + 1 = \frac{\ }{4} \Rightarrow x \quad = \frac{8}{4} \quad {}^4\ 1 - i \quad \frac{4}{4} \quad {}^4\ 1 - i$$

$$-1$$

$$2x \qquad 2x \qquad 2x4$$

$$2x^8 = 1 - i - 2x^4 \therefore (2x^8 + 2x^4)^2 = \left(1 - 1\sqrt{-1}\right)^2 =$$

$$4x^{16} + 4x^8 = 1 - 2 + 1 \therefore 4x^{16} + 4x^8 = 0 \Rightarrow 4x^{16} = -4x^8 \Rightarrow \frac{4x^{16}}{4x^8} = - \quad x^2 =$$

$$> \frac{dy}{dx}(-x^2) = -2x \Rightarrow \zeta(-2n) = 0$$

It is proved by the trivial zeros and the equation of the misiec numbers that as long as there are trivial zero numbers for every negative even number there will be numbers to the right of the graph that correspond to the sum of the limits a total of non-trivial zeroes.

Therefore, by the same reasoning, a derivative solution that gives the result of ½ for the corresponding values of the non-trivial zeros should be possible to be obtained by the same numbers that correspond to the aforementioned values.

Input interpretation:

solve	$n\,x^{n-1} = \frac{1}{2}$

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Result:

- Step-by-step solution

$$x = 2^{-1/(n-1)} \sqrt[n-1]{\frac{1}{n}}$$

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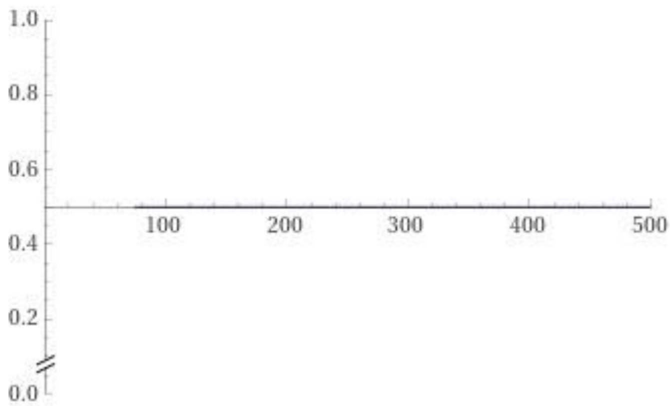
Replacing the value of n with n ^ 8 + n ^ 4-1 which was the equation used to obtain the value

of the non-trivial zeros of -2x then they are obtained when multiplied by ½ which is the value of the corresponding derivative that was used to obtain the original formula, then we have that the derivative of a constant in the same way that when -2x is zero we have to compare that the same equation gives equivalent results, one for -2x and the other for ½ * 2x equals x which would be equal a $2^{-1(n-1)} \sqrt[n-1]{\frac{1}{n}}$, therefore resulting in values that would be expressed in the imaginary value when it is considered as real value. As a surprise, the value of the integral arc would be equal to 2n-1 which can be used to define an odd number, a sine qua non condition to be prime.

plot	$\frac{1}{2}\left(2^{-1/(n^8+n^4-1)} \sqrt[n^8+n^4-1]{\frac{1}{n^8+n^4-1}}\right)$	$n = 1$ to 500

Plot:



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Arc length of curve:

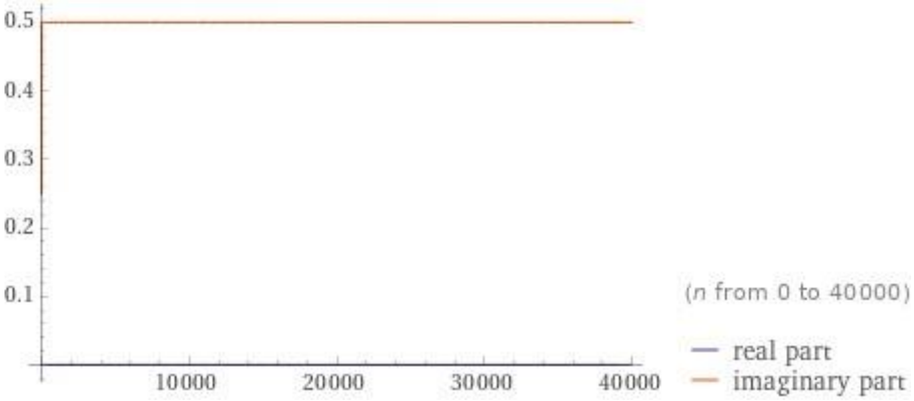
- More digits
- Step-by-step solution

$$\int_1^{500} \sqrt{\left(1 + 2^{2-2/(-1+n^4+n^8)}\, n^6\, (1+2n^4)^2 \left(\frac{1}{-1+n^4+n^8}\right)^{4+2/(-1+n^4+n^8)} \left(1+\log\left(\frac{1}{2(-1+n^4+n^8)}\right)\right)^2\right)}\, dn \approx 499.05\ldots$$

plot	$\left(\frac{1}{2}\left(2^{-1/(n^8+n^4-1)}\sqrt[n^8+n^4-1]{\frac{1}{n^8+n^4-1}}\right)\right)i$	$n = 1$ to 40000

i is the imaginary unit

Plot:



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Arc length of curve:

- More digits
- Step-by-step solution

$$\int_1^{40000} \sqrt{\left(1 - 2^{2-2/(-1+n^4+n^8)}\, n^6\, (1+2n^4)^2 \left(\frac{1}{-1+n^4+n^8}\right)^{4+2/(-1+n^4+n^8)} \left(1+\log\left(\frac{1}{2(-1+n^4+n^8)}\right)\right)^2\right)}\, dn \approx 39998.946\ldots$$

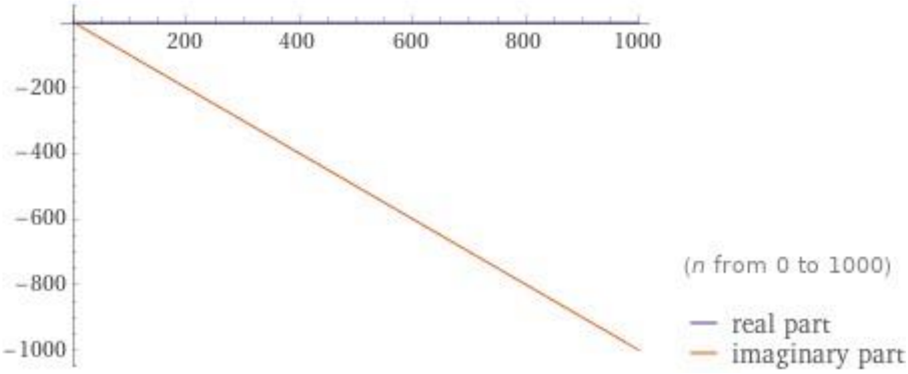
So it is like $\zeta^{(\frac{1}{2}*(2^{-\frac{1}{n^8+n^4-1}}\sqrt[n^8+n^4-1]{\frac{1}{n^8+n^4-1}}))=\frac{1}{2}}$; n from 1 to ∞

That being true there should have no alteration in the graphics when $\zeta^{(\frac{1}{2}*(2^{-\frac{1}{n^8+n^4-1}}\sqrt[n^8+n^4-1]{\frac{1}{n^8+n^4-1}}))=\frac{1}{2}+ni}$ and the graph of $\frac{1}{2}+ni$ as $\zeta^{(s)}=\frac{1}{2}+ni$

plot	$\left(\frac{1}{2}\left(2^{-1/(n^8+n^4-1)}\sqrt[n^8+n^4-1]{\frac{1}{n^8+n^4-1}}\right)\right)i - \left(\frac{1}{2}+n\,i\right)$	$n = 1$ to 1000

i is the imaginary unit

Plot:

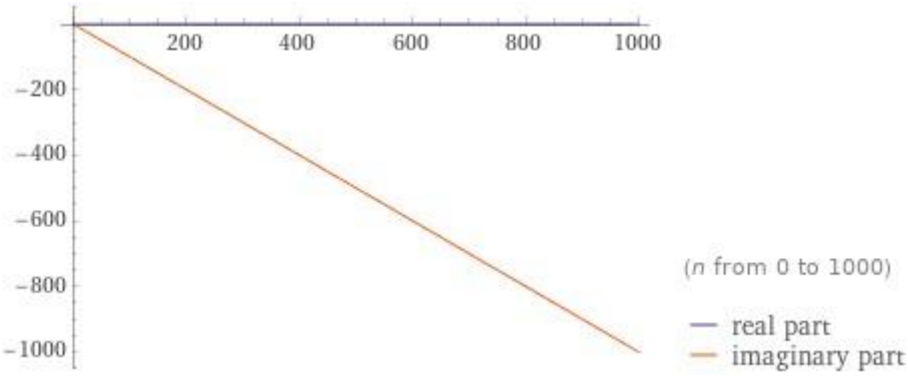


Or

plot	$\frac{1}{2}\left(2^{-1/(n^8+n^4-1)}\sqrt[n^8+n^4-1]{\frac{1}{n^8+n^4-1}}\right)-\left(\frac{1}{2}+n\,i\right)$	$n = 1$ to 1000

i is the imaginary unit

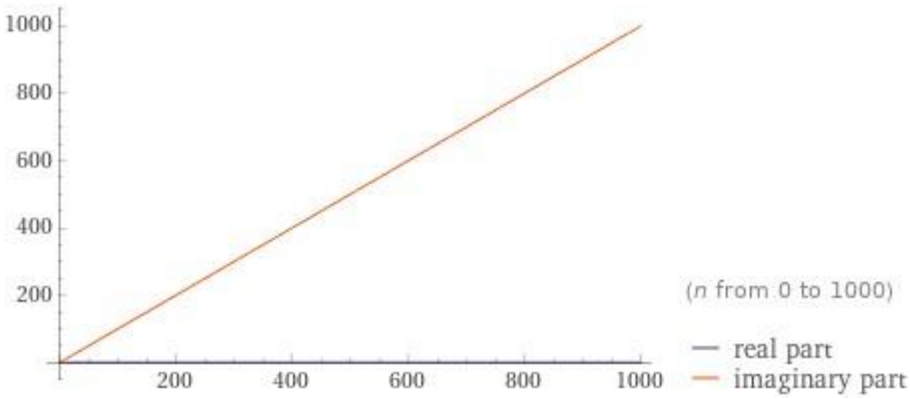
Plot:



plot	$\frac{1}{2}+n\,i$	$n = 1$ to 1000

i is the imaginary unit

Plot:



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Arc length of curve:

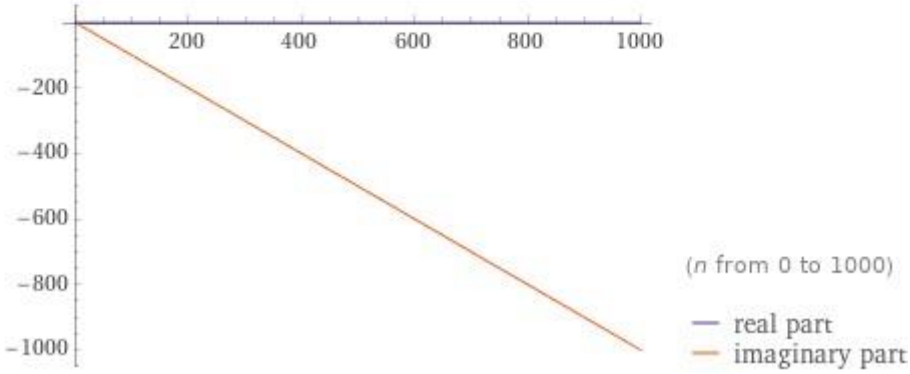
- Step-by-step solution

$$\int_1^{1000} 0\, dn = 0$$

plot	$-\left(\frac{1}{2}+n\,i\right)$	$n = 1$ to 1000

i is the imaginary unit

Plot:



- Enlarge Customize

Arc length of curve:

- Step-by-step solution

$$\int_1^{1000} 0\, dn = 0$$

Riemann zeta function values and misiec zeta complex numbers

$$\left(\frac{1}{n}\,n^{1+n\,n\,i}\right)\left(\frac{1}{n}\,n^{1-n\,n\,i}\right)$$

i is the imaginary unit

Result:

1

$$\sum_{n=1}^{\infty} \frac{n^{0+nni}\, n^{0-nni}}{n\, n}$$

i is the imaginary unit

Infinite sum:

- More digits

$$\sum_{n=1}^{\infty} \frac{n^{0+nni}\, n^{0-nni}}{n\, n} = \frac{\pi^2}{6} \approx 1.6449$$

$$\zeta(2) = 1 + \frac{1}{2} + \frac{1}{} + \frac{1}{} \ldots = \frac{\pi^2}{}{}_2 \quad 3_2 \;\; 4_2 \quad 6 = 1.64493406\ldots$$

$$\sigma = 0\ in\ 0 + nni => \zeta(2)$$

Sum convergence:

- Show tests

$$\sum_{n=1}^{\infty} \frac{n^{0+nni}\, n^{0-nni}}{n\, n} \text{ converges}$$

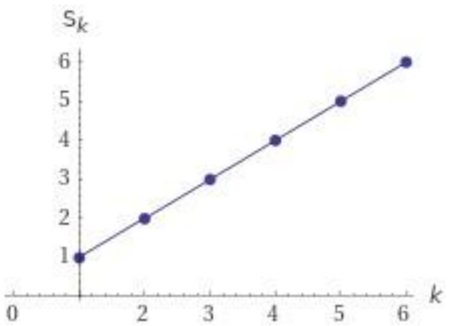
$$\sum_{n=1}^{\infty} \frac{n^{1+nni}\, n^{1-nni}}{n\, n} \text{ diverges to } \infty$$

i is the imaginary unit

Partial sum formula:

$$\sum_{n=1}^{k} \frac{n^{1+nni}\, n^{1-nni}}{n\, n} = k$$

Partial sums:



Regularized result:

Dirichlet regularization

$$\lim_{s\to 0}\left(\sum_{n=1}^{\infty} n^{-s}\right) = -\frac{1}{2}$$

$$\sum_{n=1}^{\infty} \frac{n^{1/2+nni}\, n^{1/2-nni}}{nn} \text{ diverges to } \infty$$

i is the imaginary unit

If $If\ \sigma = 0\ in\ 0 + nni => \zeta(2) and\ \sigma = -1\ in - 1 + nni => \zeta(4)(below) then:$

$\sigma{=}{-}1 => \zeta(4)$

$\sigma = \frac{1}{2}\ => \zeta(-2) \to \zeta(-2) = 0(trivial\ zeros) becomes\ also\ applied\ to$

$$\sum_{n=1}^{\infty} \frac{n^{1/2+nni}\, n^{1/2-nni}}{nn} \text{ diverges to } \infty$$

$which\ then\ can\ be\ used\ to\ prove\ that\ s = \frac{1}{2} + ni\ will\ have\ values\ of\ zero\ over\ the\ real\ part\ 1/2$

$$\sum_{n=1}^{\infty} \frac{n^{-1+nni}\, n^{-1-nni}}{nn}$$

i is the imaginary unit

Infinite sum:

- More digits

$$\sum_{n=1}^{\infty} \frac{n^{-1+nni}\, n^{-1-nni}}{nn} = \frac{\pi^4}{90} \approx 1.0823$$

$$\zeta(4) = \frac{1}{1} + \frac{1}{2^4} + \frac{1}{3^4} + \frac{1}{4^4} \ldots = \frac{\pi 4}{90} = 1.08232323 \ldots$$

$$\sigma = -1\ in - 1 + nni => \zeta(4)$$

Sum convergence:

- Show tests

$$\sum_{n=1}^{\infty} \frac{n^{-1+nni}\, n^{-1-nni}}{nn} \text{ converges}$$

$$\sum_{n=1}^{\infty} \frac{n^{-2+nni}\, n^{-2-nni}}{nn}$$

i is the imaginary unit

Infinite sum:

$$\sum_{n=1}^{\infty} \frac{n^{-2+n n i}\, n^{-2-n n i}}{n\, n} = \frac{\pi^6}{945} \approx 1.0173$$

Sum convergence:

- Show tests

$$\sum_{n=1}^{\infty} \frac{n^{-2+n n i}\, n^{-2-n n i}}{n\, n} \text{ converges}$$

$$\sum_{n=1}^{\infty} \frac{n^{-n+n n i}\, n^{-n-n n i}}{n\, n}$$

i is the imaginary unit

Approximated sum:

- More digits

$$\sum_{n=1}^{\infty} \frac{n^{-n+n n i}\, n^{-n-n n i}}{n\, n} \approx 1.01578$$

Sum convergence:

- Show tests

$$\sum_{n=1}^{\infty} \frac{n^{-n+n n i}\, n^{-n-n n i}}{n\, n} \text{ converges}$$

$$\sum_{n=1}^{\infty} \frac{n^{n+n n i}\, n^{n-n n i}}{n\, n} \text{ diverges}$$

Taking the limit $n \to \infty$ *one obtains* $\zeta(\infty) = 1$

Which is the same as to say that the most simple multiplication of misiec´s zeta complex number when sigma = 1 is equal to the limit of n-> infinity, thus relating to the fact that all numbers of the zeta function when positive, to the right of the critical line lies betwen 0 and 1.

$$\left(\frac{1}{n}\, n^{1+n n i}\right)\left(\frac{1}{n}\, n^{1-n n i}\right)$$

i is the imaginary unit

Result:

1

Considering the number of factor of the product , if it is divided by the number of factors it will give a real result of ½, as it is the case for the non trivial zeros, thus if the sum diverges to infinity for given value of sigma equals 1 or ½ the fact that the sum after division of infinity by 2 does not change the result it is evidence to the fact that as far as the number keep going to infinity the number still keep at ½, and the fact that for values of sigma equals 0 or less the numbers converge, it means they are not infinit as it the case to prove that the non trivial zeros are only infinit if they they are placed at the critical line ½.

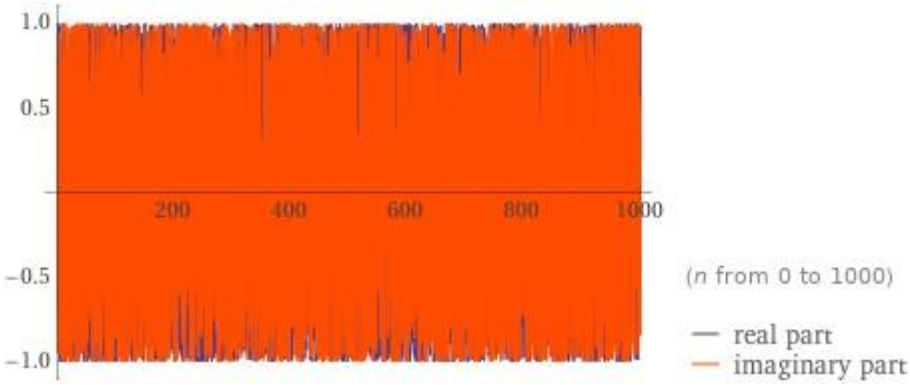
Graphical analysis corroborating that the critical line ½ already represents the numbers that should be contained in $\zeta(s) = 0 + it \;\; and \;\; 1 + it$

Attachments

plot	$\frac{1}{n^{n^2 i}}$	$n = 1$ to 1000

i is the imaginary unit

Plot:



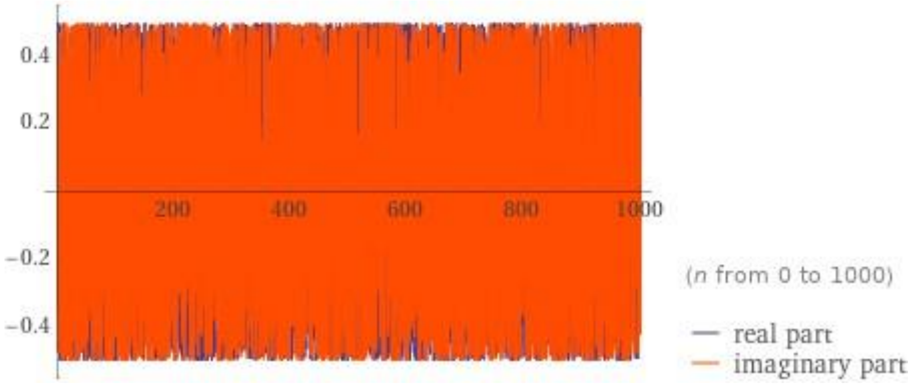
Arc length integral:

$$\int_1^{1000} \sqrt{1 - n^{2-2 i n^2} (1 + 2\log(n))^2} \, dn$$

plot	$\frac{1}{2} \times \frac{\frac{1}{n^{n^2 i}}}{1}$	$n = 1$ to 1000

i is the imaginary unit

Plot:



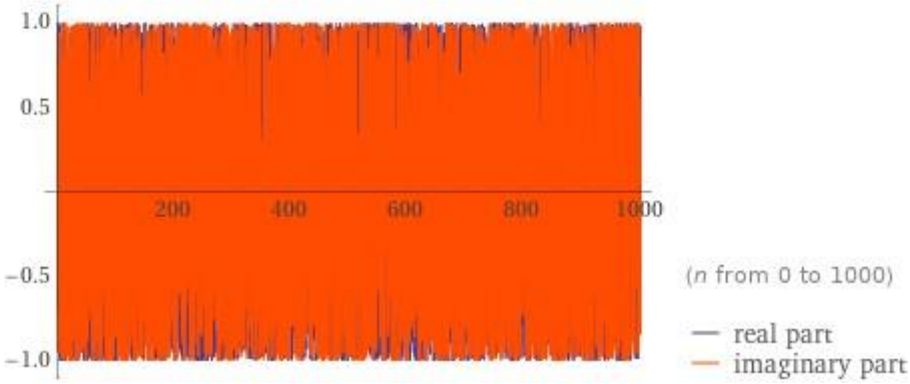
Arc length integral:

$$\int_1^{1000} \sqrt{1 - \frac{1}{4} n^{2-2 i n^2} (1 + 2 \log(n))^2} \, dn$$

plot	$\frac{1}{n^{n^2 i}}$	$n = 1$ to 1000

i is the imaginary unit

Plot:



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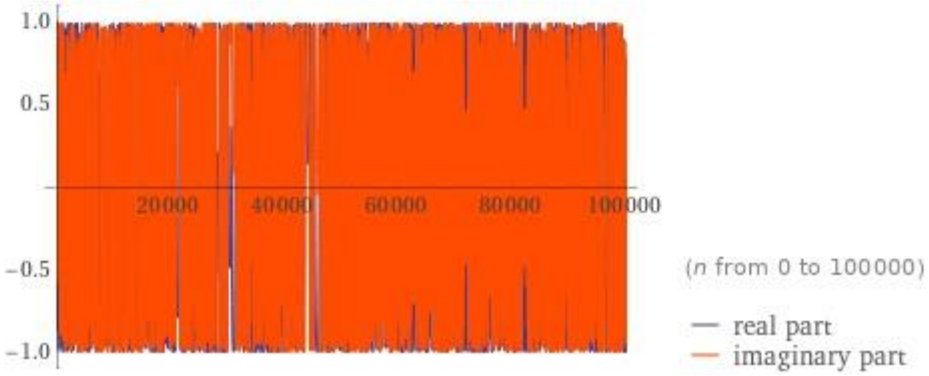
Arc length integral:

$$\int_1^{1000} \sqrt{1 - n^{2-2 i n^2} (1 + 2 \log(n))^2} \, dn$$

plot	$\frac{1}{n^{0+n i}}$	$n = 1$ to 100000

i is the imaginary unit

Plot:



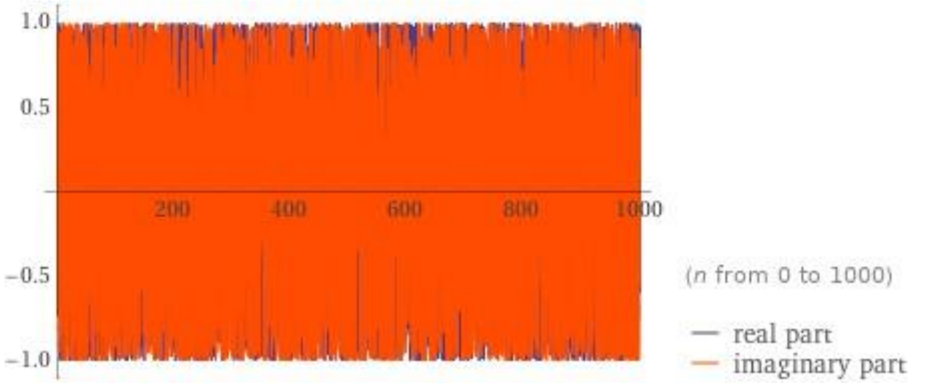
Arc length integral:

$$\int_{1}^{100000} \sqrt{1 - n^{-2 i n} (1 + \log(n))^2} \, dn$$

plot	$\frac{1}{n} n^{1+n n i}$	$n = 1$ to 1000

i is the imaginary unit

Plot:



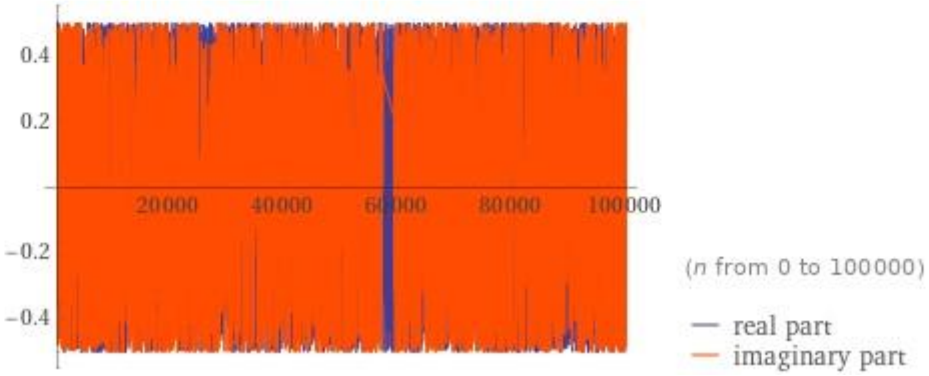
Arc length integral:

$$\int_{1}^{1000} \sqrt{1 - n^{2+2 i n^2} (1 + 2 \log(n))^2} \, dn$$

plot	$\frac{1}{2} \left(\frac{1}{n} n^{1+n n i} \times \frac{1}{n} n^{1+n n i}\right)$	$n = 1$ to 100000

i is the imaginary unit

Plot:



Arc length integral:

$$\int_1^{100000} \sqrt{1 - n^{2+4 i n^2} (1 + 2 \log(n))^2} \, dn$$

log(x) is the natural logarithm

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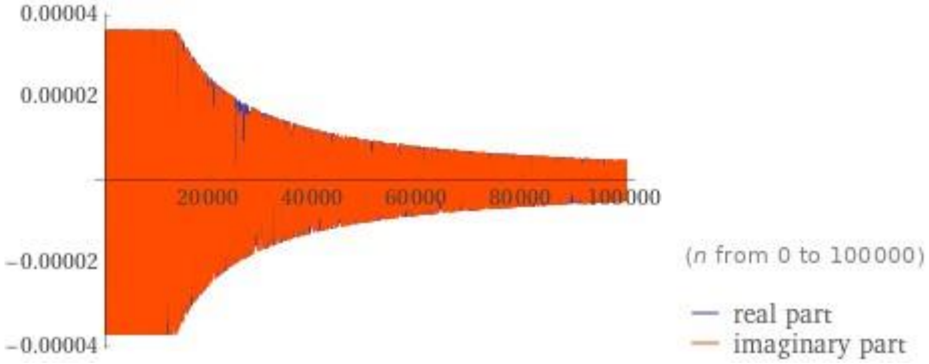
plot	$\frac{1}{2}\left(\frac{1}{n} n^{0+n n i} \times \frac{1}{n} n^{1+n n i}\right)$	$n = 1$ to 100000

i is the imaginary unit

Plot:



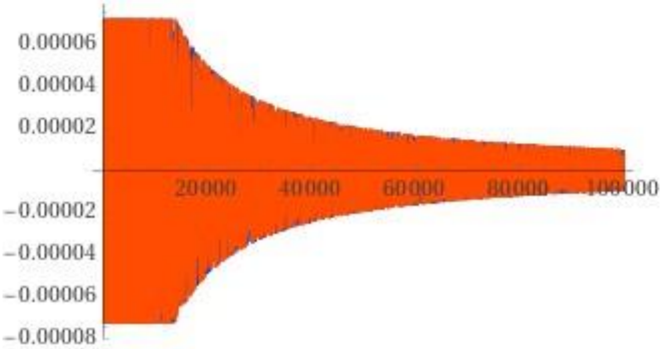
Arc length integral:

$$\int_1^{100000} \sqrt{1 - \frac{1}{4} n^{-4+4 i n^2} \left(i + 2 n^2 + 4 n^2 \log(n)\right)^2} \, dn$$

plot	$\frac{1}{n} n^{0+n n i}$	$n = 1$ to 100000

i is the imaginary unit

Plot:



(n from 0 to 100000)

— real part
— imaginary part

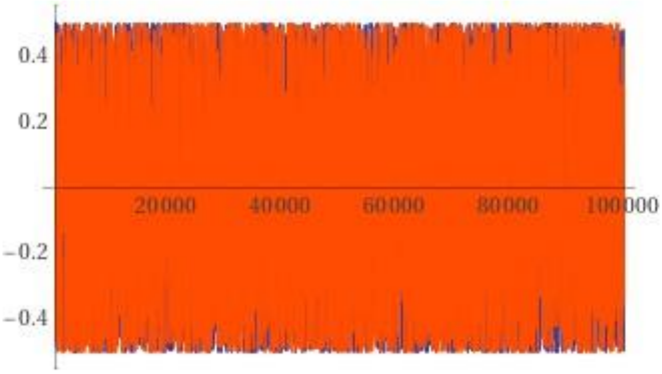
Arc length integral:

$$\int_1^{100000} \sqrt{1 - n^{-4+2 i n^2} \left(i + n^2 + 2 n^2 \log(n)\right)^2} \, dn$$

plot	$\frac{1}{2}\left(\frac{1}{n} n^{1+n n i}\right)$	$n = 1$ to 100000

i is the imaginary unit

Plot:



(n from 0 to 100000)

— real part
— imaginary part

Arc length integral:

$$\int_1^{100000} \sqrt{1 - \frac{1}{4} n^{2+2 i n^2} \left(1 + 2\log(n)\right)^2} \, dn$$

plot	$\frac{1}{n^{1/2+n i}}$	$n = 1$ to 100000

i is the imaginary unit

Plot:

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Arc length integral:

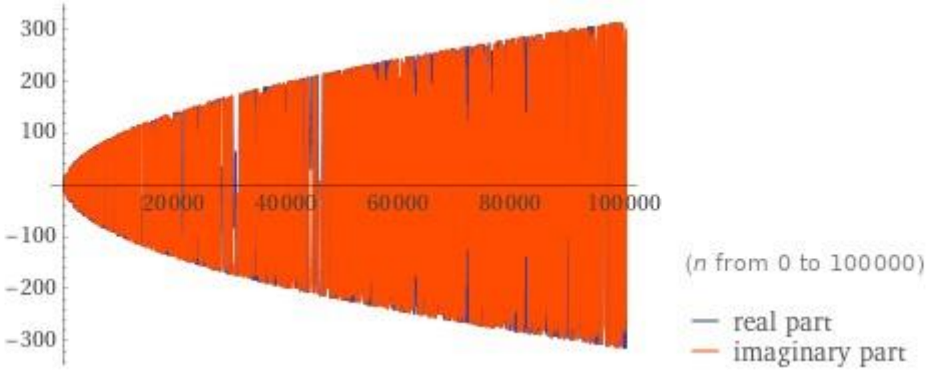
$$\int_1^{100000} \sqrt{1 - \frac{1}{4} n^{-3-2\,i\,n} (-i + 2n + 2n\log(n))^2}\, dn$$

The domain D(f)={0, ∞}; $Im\{\frac{1}{\pm\infty}, 0\}$
Which differs from f(x^-1) , for f = 1/n^(1/2+ni)

plot	$\frac{1}{\frac{1}{n^{1/2+n\,i}}}$	$n = 1$ to 100000

i is the imaginary unit

Plot:



Arc length integral:

$$\int_1^{100000} \sqrt{1 + n^{-1+2\,i\,n} \left(\frac{1}{2} + i\,n + i\,n\log(n)\right)^2}\, dn$$

log(*x*) is the natural logarithm

The domain D(f(x^-1))={0,∞}; $Im\{0, +\infty\}$

While the domain D for f(x^-1)=f(x) for x either being $\frac{1}{n^{\frac{1}{2}\,ni}}$ $or(\frac{1}{n^{\frac{1}{2}\,ni}})^\wedge - 1$ or $\frac{1}{n} *$

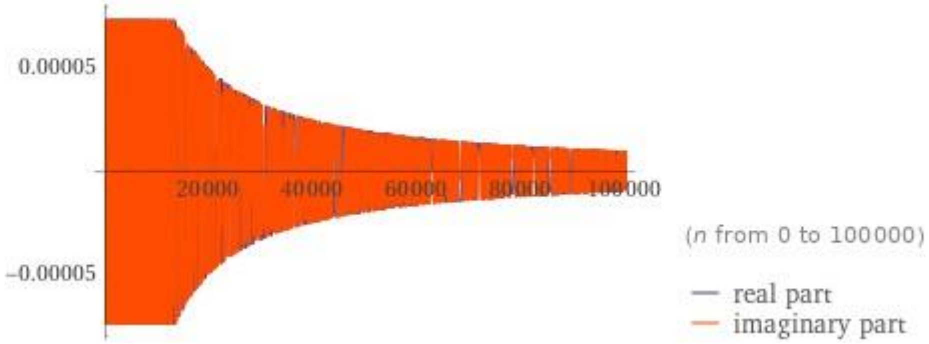
$n^{(1+n*n*i)\ or\ (\frac{1}{n}*n^{(1+n*n*i)})^{\wedge-1}} = \{0,\infty\}\ and\ \ Im = \{-1,1\}$ what can then be used to justify that non trivial zeros obtained in the image are only possible to exist to infinity when considered $\theta = 1/2$

$\log(x)$ is the natural logarithm

plot	$\frac{1}{n^{1/2+n\,i}} \times \frac{1}{n^{1/2+n\,i}}$	$n = 1$ to 100000

i is the imaginary unit

Plot:



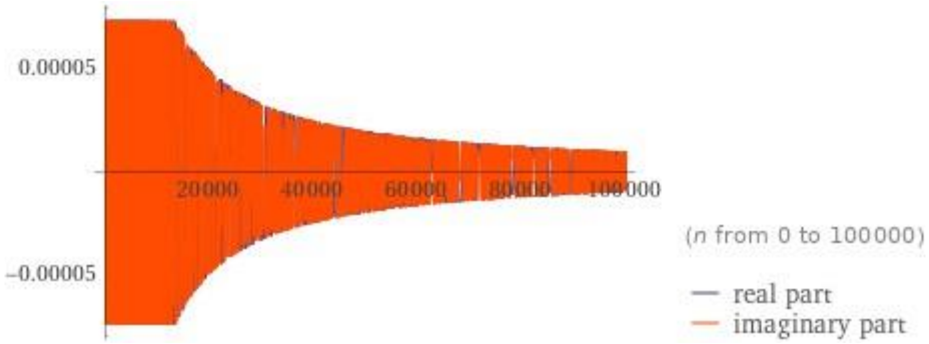
- Enlarge
- Data

Customize

Arc length integral:

$$\int_1^{100000} \sqrt{1 - n^{-4-4\,i\,n} \left(-i + 2\,n + 2\,n\log(n)\right)^2}\, dn$$

plot	$\frac{1}{n^{1+n\,i}}$	$n = 1$ to 100000

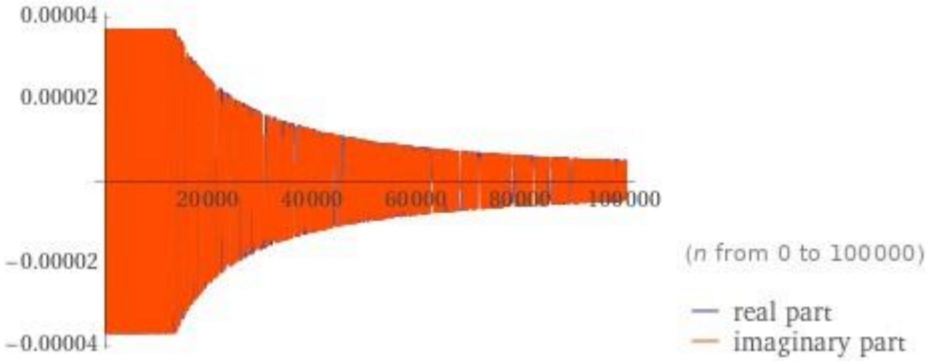


$$\int_1^{100000} \sqrt{1 - n^{-4-2\,i\,n} \left(-i + n + n\log(n)\right)^2}\, dn$$

plot	$\frac{1}{n^{1/2+n i}} \times \frac{1}{n^{1/2+n i}} \times \frac{1}{2}$	$n = 1$ to 100000

i is the imaginary unit

Plot:



- Enlarge
- Data
  Customize

Arc length integral:

$$\int_1^{100000} \sqrt{1 - \frac{1}{4} n^{-4-4 i n} (-i + 2 n + 2 n \log(n))^2} \, dn$$

Which is equal to the equation below (1/n*n^(1/2_n*n*i) compared to (1/n^(1/2+n*i) (that is the Riemann zeta function and the first the misiec´s numbers)

$\log(x)$ is the natural logarithm

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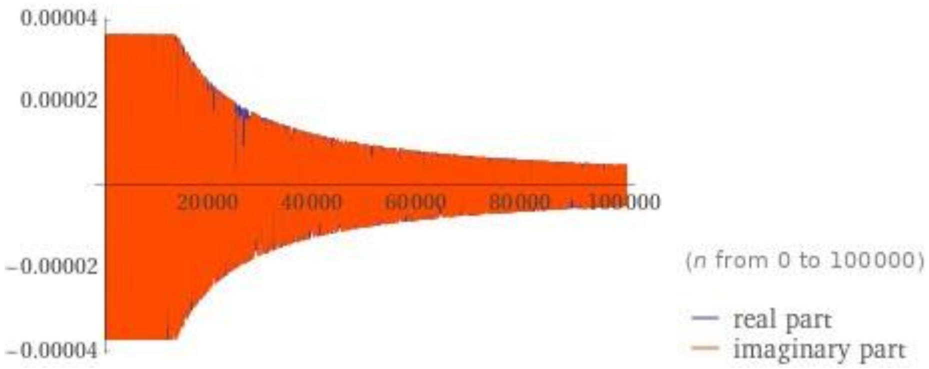
plot	$\frac{1}{2}\left(\frac{1}{n} n^{1/2+n n i} \times \frac{1}{n} n^{1/2+n n i}\right)$	$n = 1$ to 100000

i is the imaginary unit

Plot:



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- Data
Customize

Arc length integral:

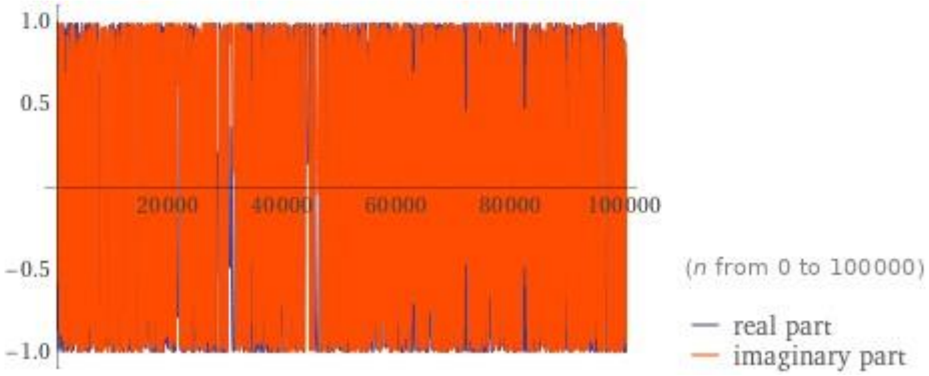
$$\int_{1}^{100000} \sqrt{1 - \frac{1}{4} n^{-4+4 i n^2} \left(i + 2 n^2 + 4 n^2 \log(n)\right)^2}\, dn$$

$\log(x)$ is the natural logarithm

plot	$\dfrac{1}{\frac{1}{n} n^{1+n i}}$	$n = 1$ to 100000

i is the imaginary unit

Plot:



Arc length integral:

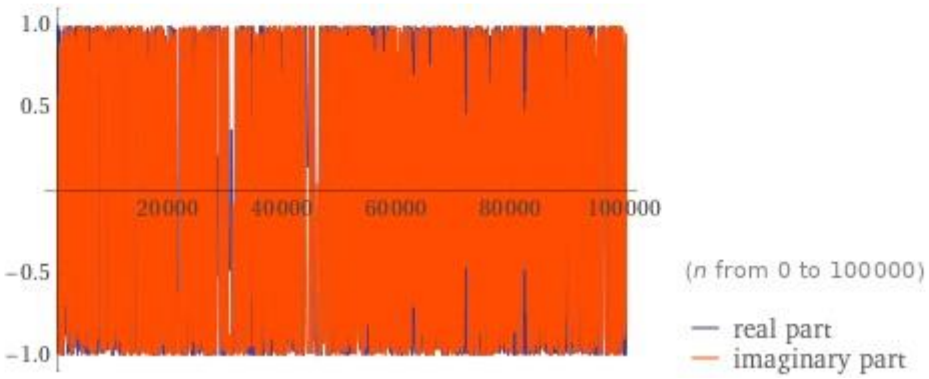
$$\int_{1}^{100000} \sqrt{1 - n^{-2 i n} (1 + \log(n))^2}\, dn$$

Which is equal to the inverse of F(x^-1) where x= (1/n*n^(1+n*n*i))

plot	$\frac{1}{n} n^{1+n i}$	$n = 1$ to 100000

i is the imaginary unit

Plot:



Arc length integral:

$$\int_1^{100000} \sqrt{1 - n^{2 i n} (1 + \log(n))^2} \, dn$$

log(x) is the natural logarithm

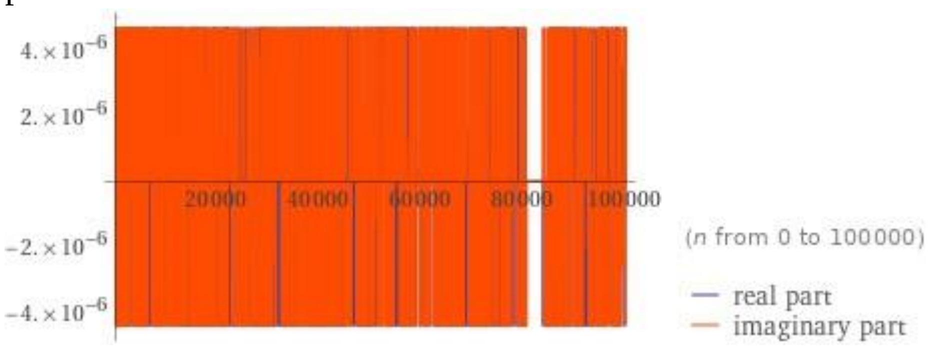
Above : F(x^-1) where x= (1/n*n^(1+n*n*i))=F(x) x=(1/n*n^(1+n*n*i))

plot	$\left(\frac{1}{n} n^{1/n^{n^2 i}+n n i}\right)\left(\frac{1}{n} n^{1/n^{n^2 i}+n n i}\right)$	$n = 1$ to 100000

i is the imaginary unit

Plot:

- Comple
  x-
  valued
  plot



Arc length integral:

$$\int_1^{100000} \sqrt{\left(1 + n^{-6+4 i n^2+4 n^{-i n^2}} \left(-2 + 2 i n^2 + 2 n^{-i n^2} + 2 i n^{2-i n^2} \left(-1 + 2 n^{i n^2} - 2 \log(n)\right) \log(n)\right)^2\right)} \, dn$$

log(x) is the natural logarithm

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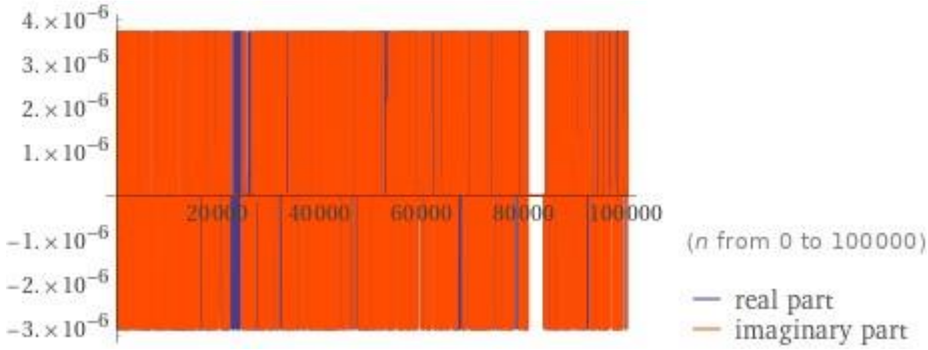
plot	$\left(\frac{1}{n}\, n^{1/n^{n^2 i}+n n i}\right)\left(\frac{1}{n}\, n^{1/n^{n^2 i}+n n i}\right)\times\frac{1}{n^{n^2 i}}$	$n = 1$ to 100000

i is the imaginary unit

Plot:

- Complex-valued plot



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Arc length integral:

$$\int_1^{100000} \sqrt{1 - n^{-6+4n^{-i n^2}} \left(-2\,i + 2\,i\, n^{i n^2} + n^{2+i n^2} + 2\,n^2 \left(-1 + n^{i n^2}\right)\log(n) - 4\,n^2 \log^2(n)\right)^2}\, dn$$

$n^{n^{n^{-x}}} n^{n^{x}}$

Result:

$n^{n^{n^{-x}+n^{x}}}$

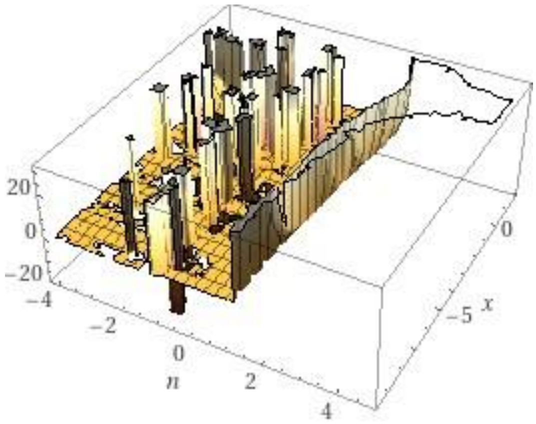
Values:

n	
0	$0^{0^{0^{-x}+0^{x}}}$
1	1
2	$2^{2^{2^{-x}+2^{x}}}$
3	$3^{3^{3^{-x}+3^{x}}}$

3D plots:

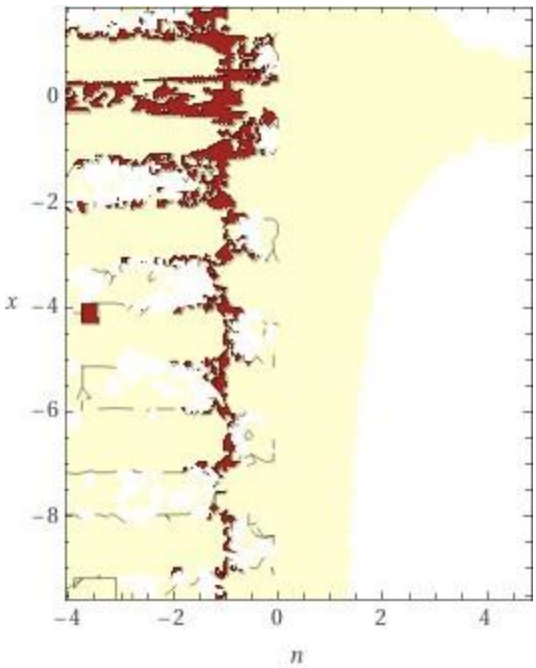
Real part

- Show contour lines

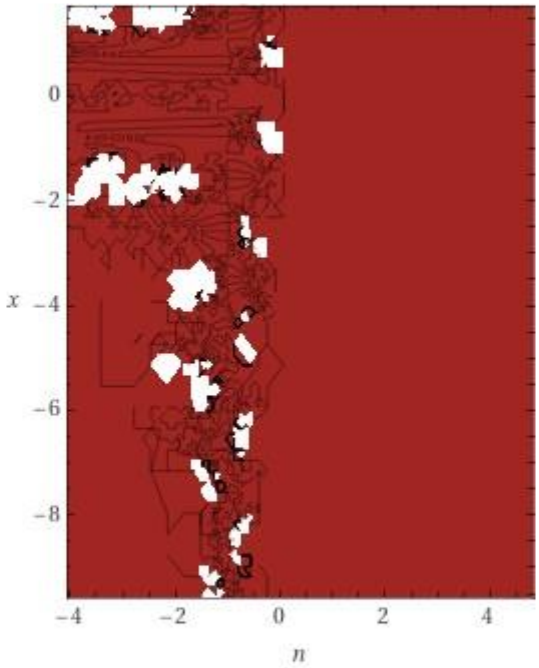


Contour plots:

Real part



Imaginary part



Roots:

(no roots exist)

Properties as a real function:

Domain

$\{x \in \mathbb{R} : (n < 0 \text{ and } n^{n^{-x}+n^x} \in \mathbb{Z} \text{ and } n^{-x} \in \mathbb{Z} \text{ and } n^x \in \mathbb{Z} \text{ and } x \in \mathbb{Z}) \text{ or } n > 0\}$

Parity

even

$\mathbb{R}$ is the set of real numbers
$\mathbb{Z}$ is the set of integers

Periodicity:

- Approxi
mate
form

periodic in x with period $\frac{2 i \pi}{\log(n)}$

$\log(x)$ is the natural logarithm

Series expansion at x = 0:

$$n^{n^2} + n^{n^2+2} x^2 \log^4(n) + \frac{1}{12} n^{n^2+2} x^4 \log^6(n) \left(6 n^2 \log^2(n) + 6 \log(n) + 1\right) + O\left(x^6\right)$$

(Taylor series)

Big-O notation »

Derivative:

- Step-by-
step
solution

$$\frac{\partial}{\partial x}\left(n^{n^{-x}\, n^{n^x}}\right) = n^{n^{-x}+n^x+n^{n^{-x}+n^x}-x} \left(n^{2x} - 1\right) \log^3(n)$$

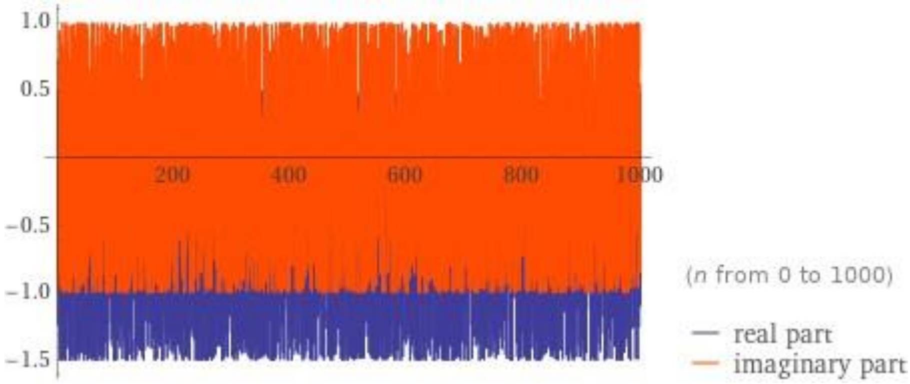
Limit:

$$\lim_{x\to\pm\infty} n^{n^{n^{-x}+n^{x}}} = 1 \text{ for } \log(n) < 0$$

plot	$n^{-(n^2 i)} - \frac{1}{2}$	$n = 1$ to 1000

i is the imaginary unit

Plot:



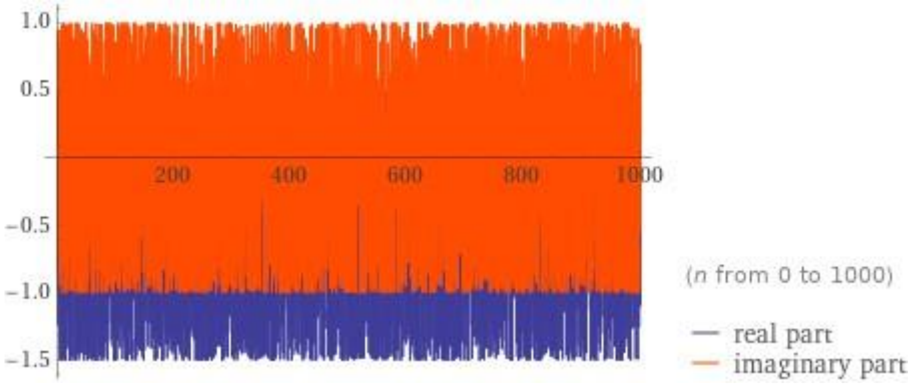
Arc length integral:

$$\int_1^{1000} \sqrt{1 - n^{2-2 i n^2} (1 + 2\log(n))^2}\, dn$$

plot	$n^{n^2 i} - \frac{1}{2}$	$n = 1$ to 1000

i is the imaginary unit

Plot:



Arc length integral:

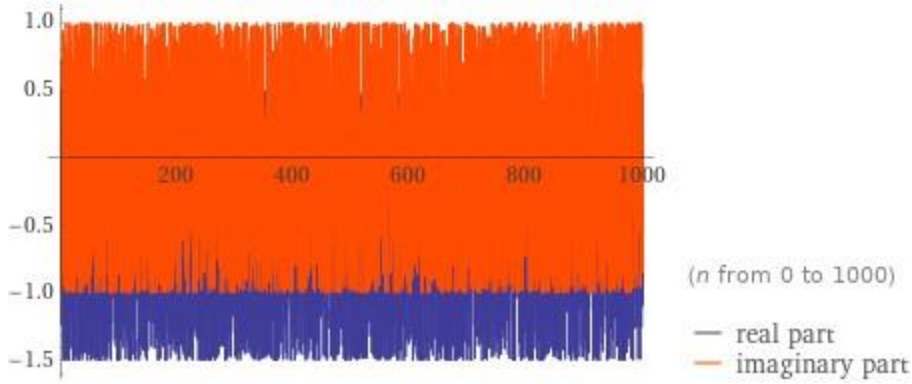
$$\int_1^{1000} \sqrt{1 - n^{2+2 i n^2} (1 + 2 \log(n))^2}\, dn$$

plot	$\frac{n}{n^{1+n n i}} - \frac{1}{2}$	$n = 1$ to 1000

$\frac{1}{n^{n^2 i} * n^{n^0}} = \frac{1}{2 * n^{n^0}}$(obtained from (1) below, is equal to the equation just above) which can then be atributed the value of ½ to n/n^(1+in^2) just as it is atributed ½^(n^2*i) when sigma is equal 0. So all the values obtained from (s)=$\theta + n^2 i = (s) = \theta_1 + n^2 i$

When $\theta = 0$ $or \theta_1 = 1$.Else $\frac{n}{1+n_{nni}}$ $rewritten\ as$ $\frac{n}{0+n_{nni}}$ $because$ $0 = 1$ $both\ are\ equal\ to$ ½ changing the position of -1/2 to the right of the equal sign.Or

else just considering $\frac{}{n1n+1nni} = \frac{}{n1n+0nni} => \frac{}{n1+nnni} = \frac{}{n1+1nni}$



Arc length integral:

$$\int_1^{1000} \sqrt{1 - n^{2-2 i n^2} (1 + 2 \log(n))^2}\, dn$$

$\frac{}{n} * n^{(0+n\ i)} = (\frac{n}{\ } \frac{n}{2}$)->$\frac{}{n} = \frac{}{\frac{n}{2}} \rightarrow 2n *$ 1 2 $\frac{1}{-} * n^{\left(\frac{1}{2}+n^2 i\right)} * \frac{1}{-} * n^{\left(\frac{1}{2}+n^2 i\right)}$ $nn2i$ $n*n2n2i$ $nn2i$

$= n2 * n2n2i \rightarrow$

$\frac{}{n2n2i} = n^2 => \frac{n}{\frac{2}{nn\,i}} = n^2 => \frac{2}{\frac{2}{nn\,i}} = 1 => \frac{1}{\frac{2}{nn\,i}} = \frac{1}{2}$ (1) $2n * n^{n2i}$ $2n*$

$\frac{nn2i}{n} = 2/n == (\frac{n}{\ } \frac{\frac{1}{-} * n^{\left(\frac{1}{2}+n^2 i\right)} * \frac{1}{-} * n^{\left(\frac{1}{2}+n^2 i\right)}}{\frac{n}{2}}$)=>$\frac{1}{n} = \frac{1}{n} * \frac{1}{n} * n$ $\left(\frac{1}{2}+n^2 i+\frac{1}{2}+n2i\right)$ $=> n =$

n^{1+2n2i} $for\ the\ exponents$ $1 = 1 + 2n^2 i => 2n^2 i = 0$ or $n^2 i = \frac{0}{2} =$
0 $substituting\ in$ $\frac{n}{1}$ $\frac{1}{n^2 i} = \frac{}{2} => 1 = 0$ $for\ the\ given\ match\ initially$

It is a way of saying that $\theta\ in \zeta(n) = \qquad \theta +$

$it \quad are\ equally\ represented\ as\ 1\ and\ 0\ when\ considering\ the\ product\ of\ \frac{\frac{1}{n} * n^{\left(\frac{1}{2}+n^2 i\right)} * \frac{1}{n} * n^{\left(\frac{1}{2}+n^2 i\right)}}{2}$

As if ½ in sigma can represent the mean product of sigma 0 and 1 as it can be seen below as the equality of the sum to infinity becomes the same, as if we can say that the sigma ½ already considers the values for sigma 0 and 1.

$$\sum_{n=1}^{\infty} \frac{n^{1/2+n n i}\, n^{1/2+n n i}}{n n}$$

i is the imaginary unit

Approximated sum:

- More digits

$$\sum_{n=1}^{\infty} \frac{n^{1/2+n n i}\, n^{1/2+n n i}}{n n} \approx 1.43016 + 0.161086\, i$$

$$\sum_{n=1}^{\infty} \frac{n^{1/2+n n i}\, n^{1/2+n n i}}{n n} \text{ converges}$$

$$\sum_{n=1}^{\infty} \frac{n^{1+n n i}\, n^{0+n n i}}{n n}$$

i is the imaginary unit

Approximated sum:

- More digits

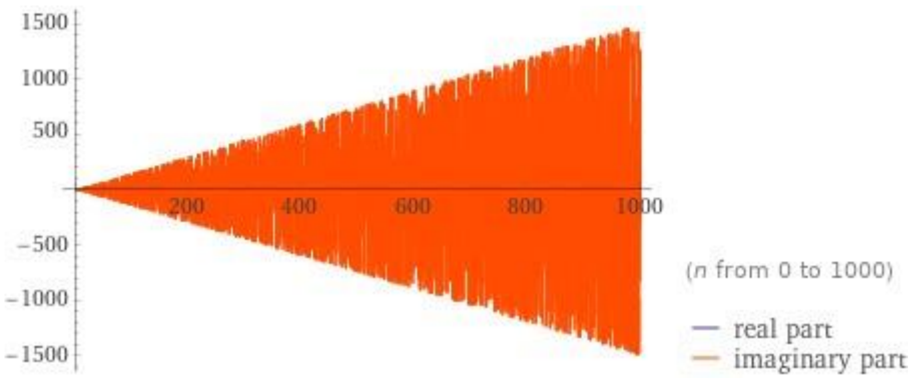
$$\sum_{n=1}^{\infty} \frac{n^{1+n n i}\, n^{0+n n i}}{n n} \approx 1.43016 + 0.161086\, i$$

$$\sum_{n=1}^{\infty} \frac{n^{1+n n i}\, n^{0+n n i}}{n n} \text{ converges}$$

plot	$n\, n^{n^2 i} - \frac{1}{2}\left(n\, n^{-n^2 i}\right) - \frac{1}{2}$	$n = 1$ to 1000

i is the imaginary unit

Plot:



Arc length integral:

$$\int_1^{1000} \sqrt{1 + \frac{1}{4} n^{-2 i n^2} \left(-1 + i n^2 + 2 i n^2 \log(n) + 2 n^{2 i n^2} \left(1 + i n^2 + 2 i n^2 \log(n)\right)\right)^2} \, dn$$

log(x) is the natural logarithm

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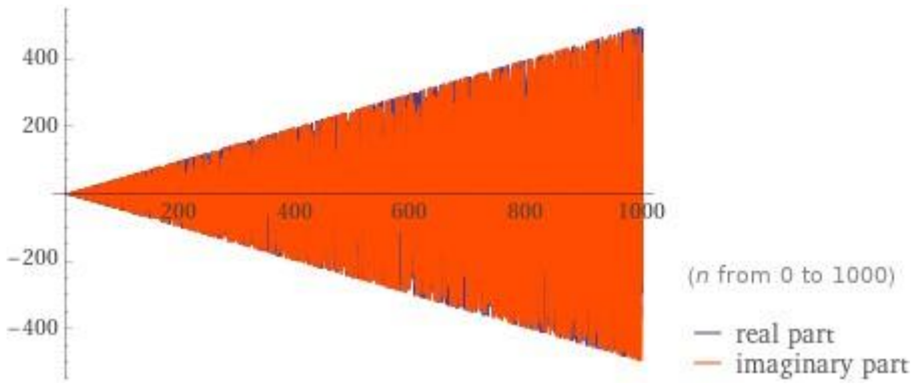
plot	$n\, n^{n^2 i} - \frac{1}{2}\left(n\, n^{n^2 i}\right) - \frac{1}{2}$	$n = 1$ to 1000

i is the imaginary unit

Plot:



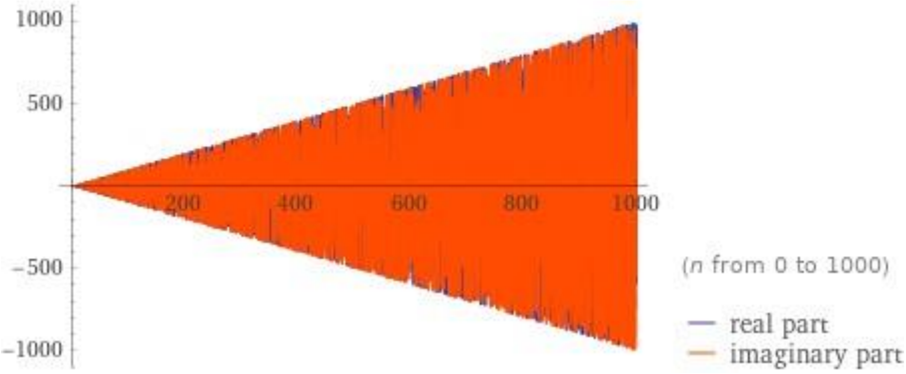
Arc length integral:

$$\int_1^{1000} \sqrt{1 - \frac{1}{4} n^{2 i n^2} \left(-i + n^2 + 2 n^2 \log(n)\right)^2} \, dn$$

plot	$n\, n^{n^2 i}$	$n = 1$ to 1000

i is the imaginary unit

Plot:



Arc length integral:

$$\int_1^{1000} \sqrt{1 - n^{2 i n^2} \left(-i + n^2 + 2 n^2 \log(n)\right)^2}\, dn$$

$\log(x)$ is the natural logarithm

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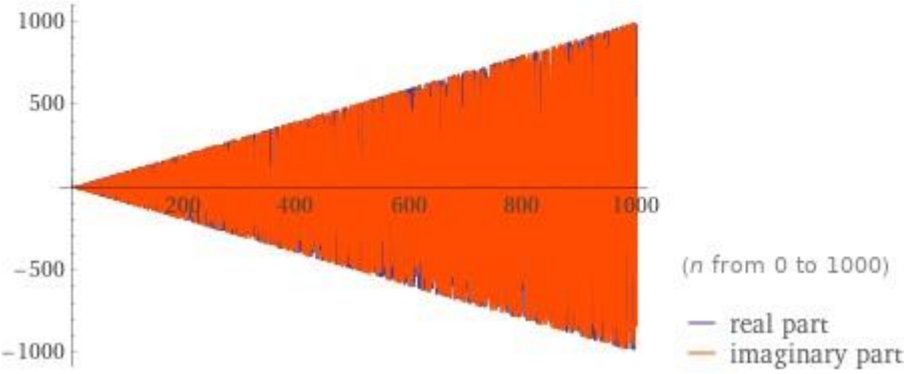
plot	$n\, n^{-n^2 i}$	$n = 1$ to 1000

i is the imaginary unit

Plot:



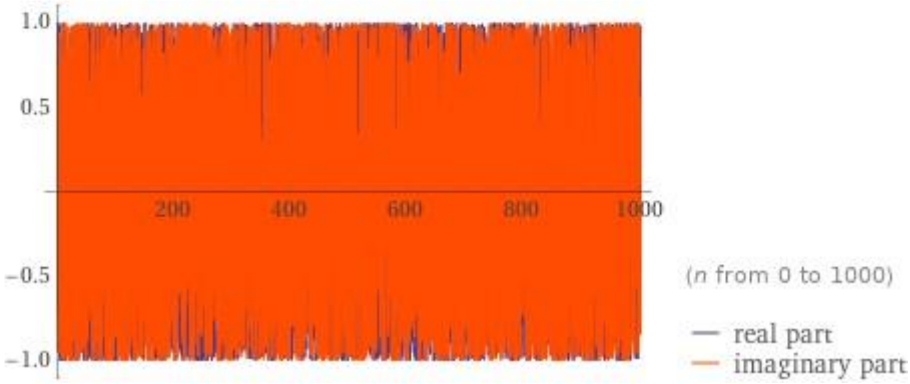
Arc length integral:

$$\int_1^{1000} \sqrt{1 - n^{-2 i n^2} \left(i + n^2 + 2 n^2 \log(n)\right)^2}\, dn$$

plot	$n^{-n^2 i}$	$n = 1$ to 1000

i is the imaginary unit

Plot:



Arc length integral:

$$\int_1^{1000} \sqrt{1 - n^{2-2 i n^2} (1 + 2 \log(n))^2} \, dn$$

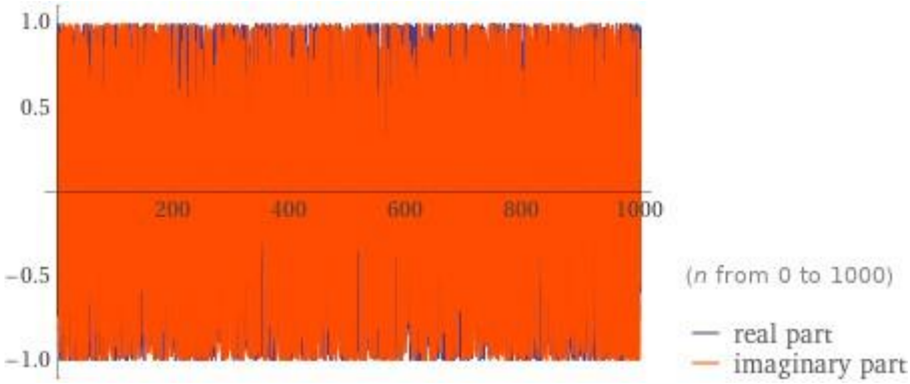
$\log(x)$ is the natural logarithm

Which is equal to f(x^-1) where x = 1/n^n^2*1 above and below

plot	$n^{n^2 i}$	$n = 1$ to 1000

i is the imaginary unit

Plot:



Arc length integral:

$$\int_1^{1000} \sqrt{1 - n^{2+2 i n^2} (1 + 2 \log(n))^2} \, dn$$

$\log(x)$ is the natural logarithm

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Conclusion:

It is proven that the nontrivial zeros of the riemann zeta function all fall on the critical line of real equal to 1/2 . For that were made 10 graphs of the summation of the zeta function assuming all prime numbers and not prime, then got the graph for the sine of all other known possibilities ... even numbers and limits of the ramanajuan function to which surprise, .. only the graph of the zeta function when considering the derivative of the imaginary as exponent had the sine graph equal to the graph of the normal sum of prime numbers. ... then considering the x-limit theorem tending to zero for the sine function of x / x which is equal to 1 ... which is exactly what happens only for the sum of prime numbers raised to their component imaginary ... this proves that the sum of imaginary prime numbers is zero, leaving only the 1/2 portion of the zeta function as the real number. On which all the imaginary primes rest ...

It is also possible from the generalization of the formula for 1/n*n^(1/2+n*n*i) to show that the only situtation where the numbers satisfy the condition for the plotting the numbers on the critical line , from the evaluation of the behavior of the exponentes, is when we consider them to be prime as shown in the last lines before the conclusion

Let me explain to you this graph is from the riemann function in it you can see that there are points of congruence between the imaginary numbers and the real numbers when they find the zero points called non-trivial zeros … the big question that is asked for proving the riemann hypothesis is what these points are and the value of the function … but it is impossible to prove that they are infinite unless it is proved otherwise in a way that is valid for any number … but if you observe the graph you notice that they are parallel when they are at the zero point … and here comes the help of God … I solved a derivative that gives a limit angle value for any number to infinity and the value of this angle is equal to the angle value of the graph … I measured it with the protractor and the angle is equal to 81 degrees my derivative of x to the imaginary gives a value of 0.8118 whose sine is equal to 0.9 i times 90 is equal to 81 degrees making a rule of three .... it is a complete proof to prove the riemann hypothesis.

So we have a new method of obtaining prime numbers through a formula derived from the ratio of non-trivial Riemann zero numbers that linearizes the function but obeys the Hilbert-Polya conjecture, corresponding to eigenvalues of an unbounded self adjoint operator.

References:

1-Bombier E. Problems of the millennium: The Riemann Hypothesis- Institute for Advanced Study, Princeton, NJ 08540

2-E. calculo Available at http://ecalculo.if.usp.br/ferramentas/limites/calculo_lim/exemplos/exemplo7.htm on 03 of january of 2020.

3- https://commons.wikimedia.org/wiki/File:RiemannCriticalLine.svg